

OF FISHES

# COMMERCIAL FISHERIES REVIEW

Vol. 25 no. 11

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NOVEMBER 1963

UNITED STATES DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Bureau of Commercial Fisheries  
Washington, D.C.



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# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
G. A. Albano, H. M. Bearse, and H. Beasley, Assistant Editors

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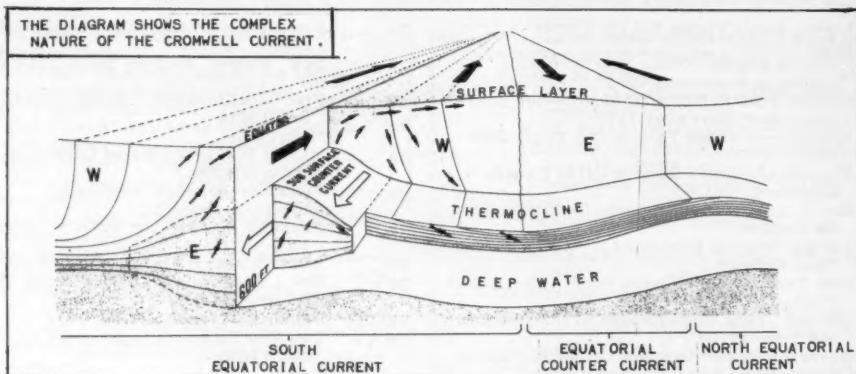
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## HANDLING AND PACKING OF FROZEN BREADED SHRIMP AND INDIVIDUALLY FROZEN PEELED AND DEVEINED SHRIMP

By Charles F. Lee\* and F. Bruce Sanford\*\*

### BACKGROUND

The shrimp industry of the South Atlantic and Gulf coasts is one of the leading fisheries of the United States both in value of the original catch and in value of the processed products. Even the weight of catch, which usually ranges from one-fifth to one-fourth of a billion pounds, is impressive. Statistics for several typical years are given in table.

Area of Catch and Type of Product	Production				Value			
	1960	1956	1954	1950	1960	1956	1954	1950
	..... (Million Pounds) .....				..... (Million Dollars) .....			
Area of Catch:								
South Atlantic .....	31.0	25.5	28.6	36.5	8.5	7.8	6.9	10.0
Gulf .....	205.7	193.6	237.2	151.8	57.6	62.5	53.7	33.1
Total .....	236.7	219.1	265.8	188.3	66.1	70.3	60.6	43.1
Type of Product: <sup>2/</sup>								
Breaded shrimp .....	70.4	50.9	24.8	6.6	47.0	37.3	17.6	4.2
Individually frozen shrimp <sup>3/</sup> .....	19.3	7.5	4.2	No data	18.5	7.3	2.6	No data

<sup>1/</sup>E. A. Power -- *Fishery Statistics for the United States - 1960*, U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, and other years noted.  
<sup>2/</sup>Some of the major shrimp products produced other than raw headless.  
<sup>3/</sup>Includes some bulk-packed, peeled, and deveined shrimp.

Although the amount of shrimp caught remained relatively constant during the 1950's, the value of breaded shrimp increased more than tenfold. Plants for producing breaded shrimp increased from 1 in 1949 to 25 in 1960 with products worth in excess of \$60 million a year.

In addition to breaded shrimp, individually frozen peeled and deveined shrimp is another product packed by many of the breading plants that is rapidly increasing in popularity and in quantity of production.

### PROCESSING METHODS

Initially, breading shrimp was strictly a hand operation, but as demand increased, the need for machines to reduce the amount of hand labor became urgent, and several mechanical devices for breading shrimp were developed. Some shrimp are still breaded by hand, but most are now breaded by machine. Devices were also invented to peel and devein shrimp. Although many of these devices are in use, hand peeling and deveining are employed in a number of plants for processing the larger shrimp and for manufacturing products of premium quality. Packing the shrimp in boxes is done entirely by hand. Furthermore, no inexpensive method has yet been found that is as good as a hand operation to distribute shrimp over a pan.

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U. S. Bureau of Commercial Fisheries.

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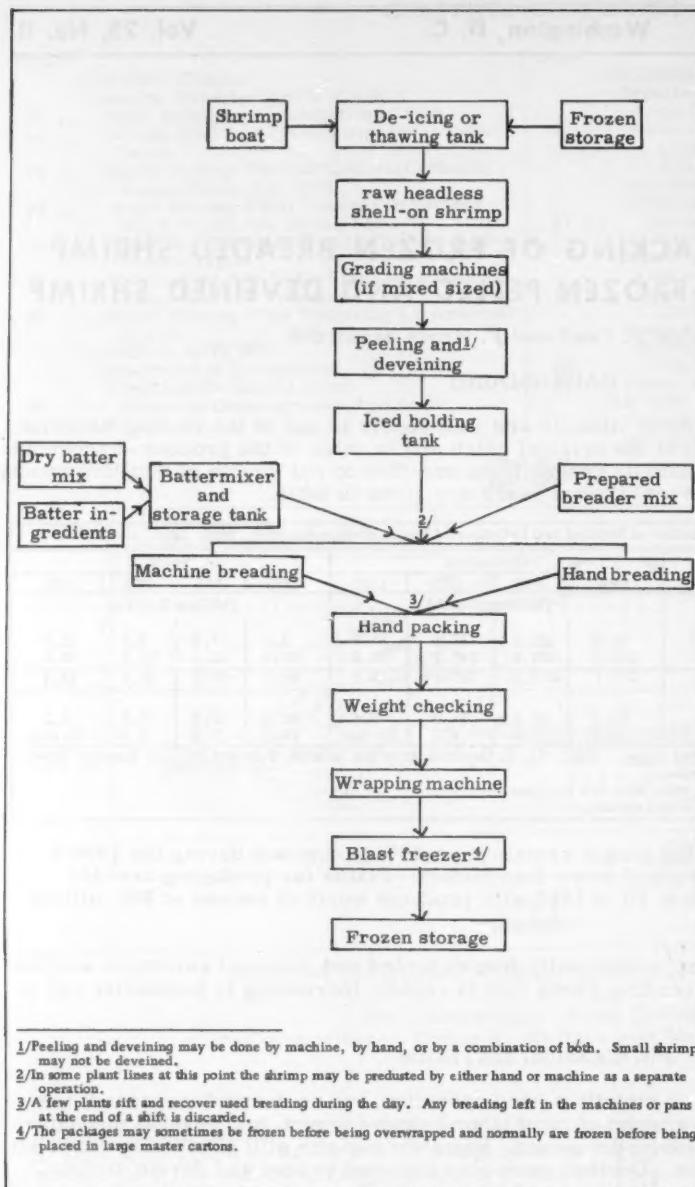


Fig. 1 - Flow diagram showing variations in processing in the preparation of frozen raw breaded shrimp (USDI inspectors check product and processing operations at all points.)

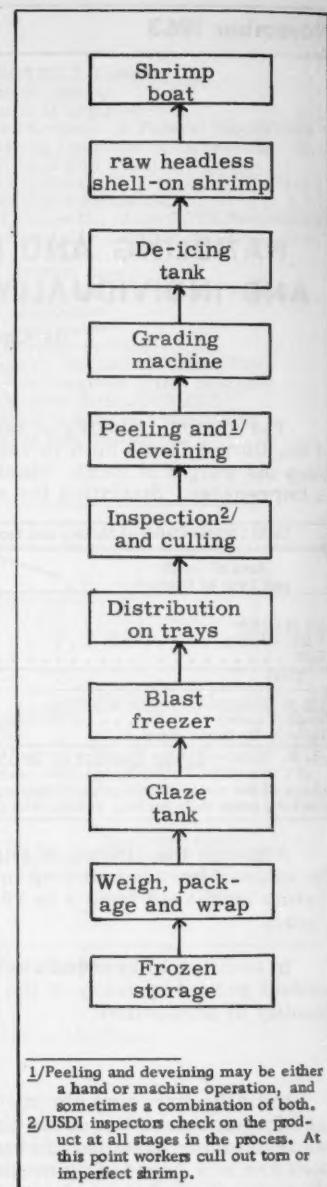


Fig. 2 - Flow diagram for individually frozen peeled and deveined shrimp.



Fig. 3 - Shrimp boats at Thunderbolt, Ga. Note on the left the rope hoist used here, as in most areas, to lift baskets of shrimp from boat hold to dock.



Fig. 4 - The busy shrimp port at Hooker's Point, Tampa, speeds unloading operations by means of bucket conveyors.



Fig. 5 - The bucket leg can be lowered into the boat hold. Note pulley on the upper right.



Fig. 6 - Conveyor in withdrawn position. Shrimp mixed with ice drop into the tank in center left.



Fig. 7 - After unloading, the crew--usually two to four men--secure the net before icing for the next trip.

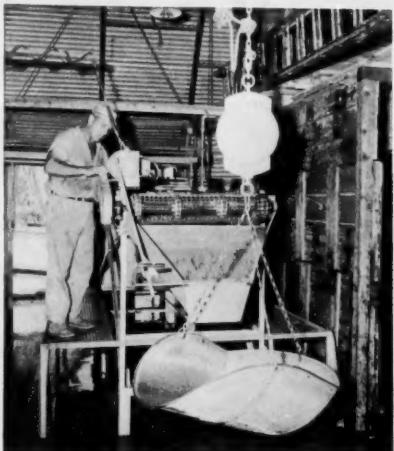


Fig. 8 - The conveyor from the wash tank discharges the shrimp directly to a large scale-scoop. In each "100-pound box, " 105 pounds are packed to allow for water and ice. These plants handle only fresh shrimp, which are destined for either the breading plant or the freezer.



Fig. 9 - At the breading plant, the boxes of iced shrimp are dumped into a large deicing and washtank that extends outside the building. The conveyor carries the shrimp into the coldroom. Here a U. S. Department of the Interior (USDI) inspector is examining the shrimp.

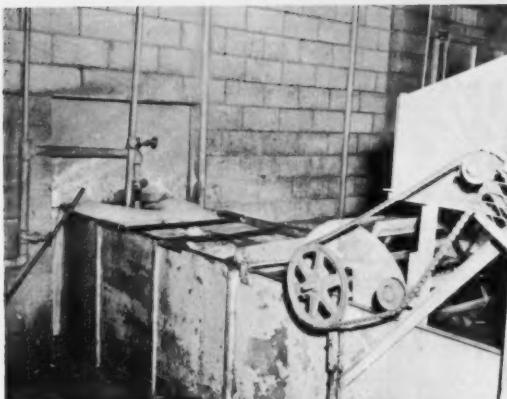


Fig. 10 - From inside the coldroom another washtank extends through the outer wall. The conveyor at the right carries shrimp to the graders.



Fig. 11 - The shell-on shrimp are graded for size as they slide down between inclined rolls set at a slight angle. When there is a wide range of sizes in the material being fed, two graders are often operated in tandem, as in this installation. Three or four sizes can be graded out during one pass over the rollers.



Fig. 12 - A USDI inspector is checking the shrimp coming from the grader. High quality of raw shrimp is essential for a Grade A breaded product.



Fig. 13 - After being graded, the shrimp are peeled and deveined. For the best grade of product, this operation is still carried out by hand. Bins feed the shell-on shrimp to the workers.



Fig. 14 - Often pans or trays are used to transport the shell-on and peeled and deveined shrimp to and from the working area.



Fig. 15 - Tables and pans used by the hand peelers are either stainless steel or aluminum to facilitate cleaning and sterilization. The plant is washed down thoroughly after each shift.



Fig. 16 - Machines have been developed to speed peeling and deveining. An operator positions the shrimp as she feeds them one by one into the machine.



Fig. 17 - The machine-peeled shrimp must be inspected for adhering pieces of shell and "sand veins," which would lower the grade of the frozen breaded product. Two machine peelers are visible in the background.

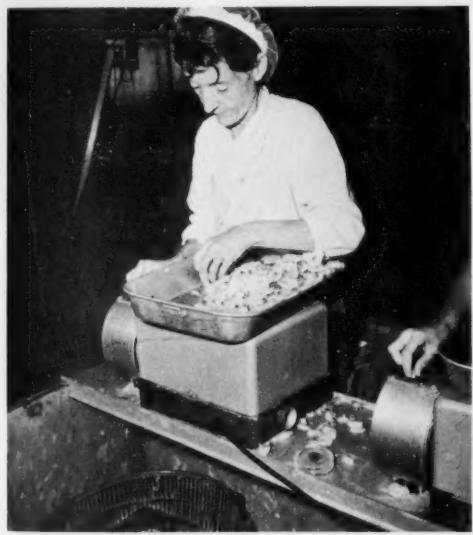


Fig. 18 - This machine, a deveiner, slits the shell and shrimp so the sand vein can be washed out, but the shell must be removed by hand.



Fig. 19 - The shells discharge from the conveyor belts under the work table. Weight lost in peeling is from 15 to 25 percent.

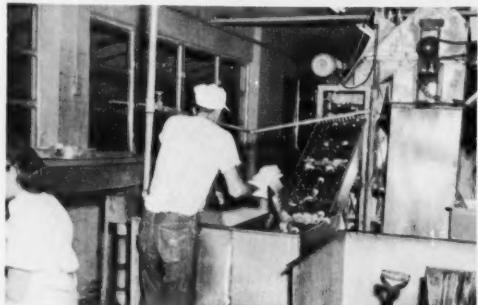


Fig. 20 - The peeled and deveined shrimp are held in a tank of ice and water until needed by the benders. The machine in the background, fed by the conveyor, is a preduster.



Fig. 21 - When only one breading machine is used, the shrimp may be predusted by tumbling shrimp and dry batter-mix in a revolving drum. Workers distribute predusted shrimp on the wire belt of the breader.



Fig. 22 - In some operations the peeled and deveined shrimp are pre-dusted by hand before going to the breading machine. Many plants use two machines in tandem, eliminating the pre-dusting operation.



Fig. 23 - Whether shrimp is breaded by hand or by machine, large quantities of batter are needed. Prepared batter mixes may be used, but many plants prefer to mix their own. Formulas used are carefully protected secrets. Mixing tank is in foreground, and holding tank in rear.



Fig. 24 - This worker is cracking whole eggs for the batter mix. Dried powdered eggs or frozen whole eggs are also, and more commonly, used.



Fig. 25 - Hand breading is still favored by some plants. Pre-dusting, batter-dipping, breading, and packing steps are all carried out by the individual worker.



Fig. 26 - Weights of the packed boxes are individually checked.



Fig. 27 - One plant has developed a special machine to batter and bread shrimp without breading the fantail. Workers suspend shrimp by the tail from pins on strips.



Fig. 28 - The strips of pinned up shrimp are secured on a rack that will carry them through a tank of batter.

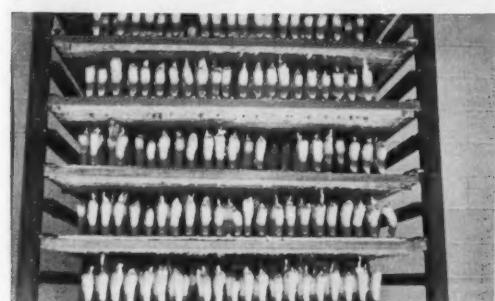


Fig. 29 - After being breaded, the strips of breaded shrimp are secured on another rack, which can be rolled into the blast freezer. Rapid freezing at temperatures from -10 to -40° F. helps preserve quality.



Fig. 30 - About 75 percent of the pack of breaded shrimp is machine-breaded. Several makes of machines are used. In all of them, good operation depends on an even distribution of the peeled and deveined shrimp on the conveyor belt.

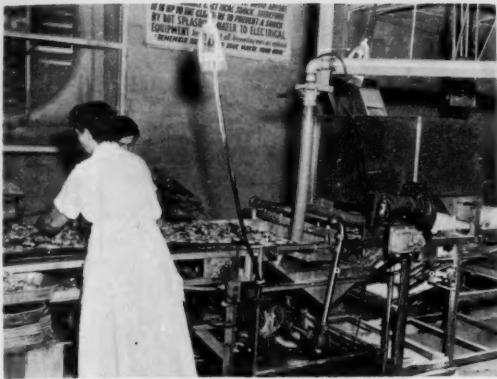


Fig. 31 - The belt with shrimp then dips under a curtain of batter flowing from the pipe in the right center. Note the many connecting unions, which permit complete separation of all parts for thorough cleaning of the batter system.

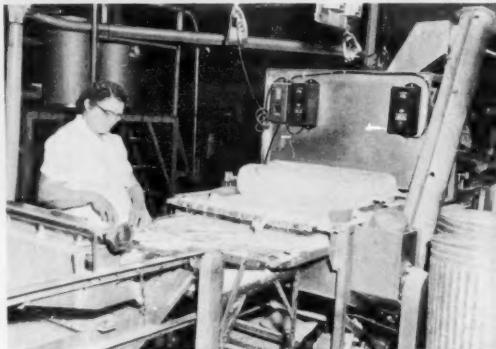


Fig. 33 - Breading also circulates, through the conveyor on the right. A layer of breading about 2-inches thick is built up on the belt to cover the shrimp. The large, soft rubber rolls then gently press the layer of shrimp and breading to get even coverage.



Fig. 35 - Some redistributing is needed before the shrimp go under the second batter curtain. Note the plastic covers on the rolls. Direction of motion is to the right.



Fig. 32 - After the batter spray, a blast of air from the duct shown in left center blows off excess batter. This operation reduces excessive pickup and loss of breading.



Fig. 34 - Excess breading separates and the reverse side of the shrimp is exposed as shrimp tumble from one conveyor to another at a lower level. This assures an even coat of breading.

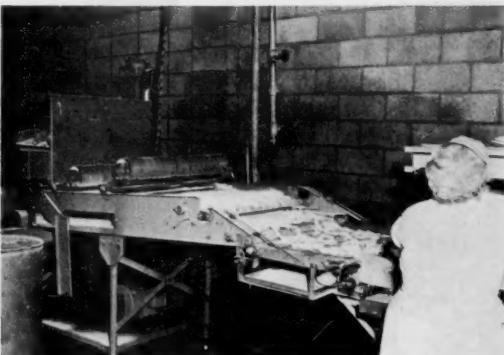


Fig. 36 - Some machines use a row of flexible stainless steel bands that pat on the breading as they intermittently press on the layer of breading and shrimp.



Fig. 37 - The end of the first breader, the second breader, the first of the packages can all be seen in normal order, and in the background, the first of the packages can all be seen in normal sequence.

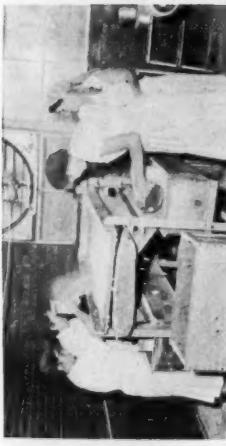


Fig. 38 - The separated breading picks up excess batter and gets lumpy. Here a vibrating offertor is used to separate lumps before reuse, in this case, by hand breading. At the end of the shift, any breading still in circulation normally is discarded.

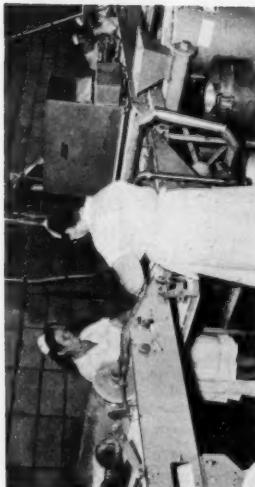


Fig. 39 - All breaded shrimp are hand-packed. Packers line back side of the discharge conveyor from the second breading machine.



Fig. 40 - In this plant, workers pack from a pan of breaded shrimp. Weight of each package is checked.



Fig. 41 - These workers are checking weight of institutional size (5-pound) packages. Conveyor at far left carries the packages to the wrapping machine.



Fig. 42 - This package shows the care used to produce an attractive product. These shrimp were pinned on strips and profoiled before being packed.



Fig. 43 - A typical wrapping machine. Rack at left is being filled with wrapped boxes. It then will be rolled into a giant freezer. Here an inspector checks the weight prior to determining the percent of breading.



Fig. 44 - These shrimp are being frozen in a plate freezer. Refrigerant circulates in each plate, and stack of movable plates and boxes is put under pressure to give contact with both box surfaces.

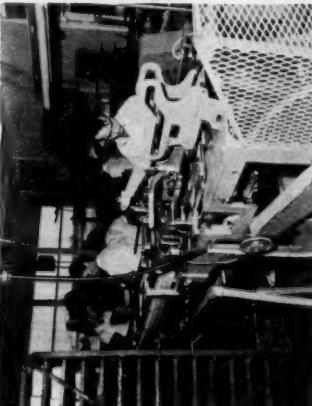


Fig. 45 - Most breaded shrimp is packed under continuous inspection. Here an inspector checks the weight prior to determining the percent of breading.



Fig. 46 - Debreaded shrimp are weighed again. Plants provide laboratories for inspector's use.



Fig. 47 - The inspector is using a slide rule to figure the breading percentage. Most inspectors are college graduates. They serve not only as inspectors but also as quality-control advisers.



Fig. 48 - Individually frozen peeled and deveined shrimp is a second and increasingly popular product of many breading plants. Peeled and deveined shrimp are laid on pans so that they do not touch one another.



Fig. 49 - The racks are loaded with the pans of peeled and deveined shrimp.

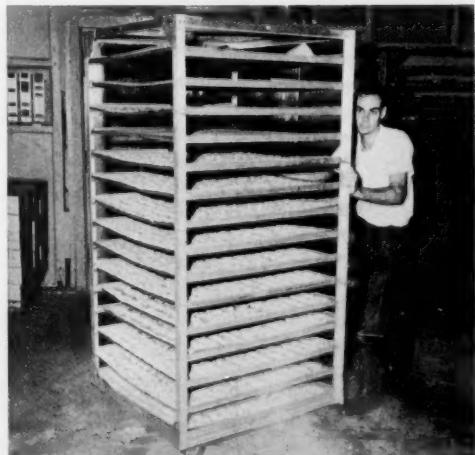


Fig. 50 - The full rack is promptly wheeled into a blast freezer.



Fig. 51 - Freezing is completed very rapidly. The frozen shrimp are dipped for a few seconds into the tank of ice water (foreground) to pick up a glaze, removed in a strainer or wire basket, and immediately packed, cased, and returned to the freezer. The plastic window box is favored to display the attractive product that results when fresh jumbo pink shrimp, preferred for individually frozen shrimp, are available.

in the production of individually frozen shrimp or to spread them across the feed belt of a breading machine so that they will be evenly covered with batter and breader mix.

#### TYPES OF PRODUCTS

Many minor variations are found in types of breaded shrimp. The most popular product, made from medium and large sizes, is "butterfly" shrimp, given this name because the deveining cut is so deep that the halves spread open like butterfly wings. Small sizes, usually used for the popular shrimp-in-a-basket, are commonly breaded round or are deveined with a shallow cut. The presence or absence of a tailfin or "fantail," with or without the adjacent shell segment, leads to several other subtypes. There is some demand for shrimp breaded with a bare tailfin, the production of which requires a hand operation or a special machine.

The amount of breading is a factor of identity, though not of grade. The maximum amount of breading permitted for a product to be graded is 50 percent. Breading content of more than 50 percent of the packed weight is considered "heavy." Special packs with medium breading (35 to 45 percent) or with light breading (less than 35 percent) command a premium price. The size of shrimp, of course, also influences the price.

#### GRADE STANDARDS

The rapid growth of the shrimp-breading industry occurred with few guidelines for quality, since breaded shrimp was a new product. In 1955, members of the industry, realizing that all producers are hurt when even small amounts of shrimp of poor quality or with excessive breading are marketed, requested the U. S. Bureau of Commercial Fisheries to develop a standard for grade of frozen raw breaded shrimp. This voluntary standard, based on several years of laboratory study, was the first to be implemented under the Bureau's Inspection Service created in July 1958. Now 21 plants pack under continuous inspection an estimated 80 percent of all breaded shrimp produced in the United States, making this standard one of the most widely used in the fishing industry.

#### MAGNITUDE AND VARIETY

The photographs in this article were taken in shrimp plants on the South Atlantic and Gulf of Mexico coasts. A flowsheet (fig. 1), illustrates the variations in processing that are encountered in the preparation of breaded shrimp. Figure 2 shows the steps in the production of individually frozen shrimp. The pictures illustrate the magnitude of the industry and the variety of machinery as well as the amount of handwork required to produce some 70 million pounds of breaded shrimp a year.

**Note: Acknowledgments:** This report was made possible by the cooperation of the industry, the following members of whom contributed directly: Henry Ambos, Trade Wind Co., Thunderbolt, Ga.; W. H. Berg, Shoreline Enterprises of America, Inc., Tampa, Fla.; J. C. Colson, Pinellas Seafoods Co., St. Petersburg, Fla.; J. R. Duggan, SeaPak Corporation, Brunswick, Ga.; H. D. Gilliken, Jekyll Island Packing Co., Brunswick, Ga.; E. C. Houdellette, Versaggi Shrimp Co., Tampa, Fla.; Leo D. Levinson, Ocean Products, Inc., Tampa, Fla.; Sam L. Lewis, Brunswick Quick Freezer, Inc., Brunswick, Ga.; H. Rhodes, Rhodes Shrimp Co., Tampa, Fla. In addition to the generous aid of the industry, we are indebted to the following of the Bureau's staff for their aid: D. Valpachio, A. Basler, Jr., T. Lowrance, B. Strawbridge, E. Johnston, and A. Petersen.



## FIVE YEARS OF VOLUNTARY FISHERY PRODUCTS INSPECTION

By J. R. Brooker\*

### ABSTRACT

This article gives a comprehensive view of the U. S. Department of the Interior Fishery Products Inspection and Certification Service.

### INTRODUCTION

The fishery products inspection and certification service of the U. S. Department of the Interior ended 5 years of operations on June 30, 1963. The actual inspections are now generally made by the Department's Bureau of Commercial Fisheries inspectors. The purpose of this article is to give the fishery industries an accounting.

The following are discussed: (1) need for inspection; (2) legal basis; (3) current status; (4) benefits; (5) cost; and (6) future prospects.

### NEED FOR INSPECTION

When the housewife goes to the market to buy fresh whole fish, she can roughly gauge the quality of the fish before she buys. If, for example, the eyes are sunken, that is an indication that the fish are not strictly fresh. When she shops for packaged fish, however, as has become increasingly the custom, she is less able to ascertain the quality until after she has bought the fish and has opened the package.

If at that time, she finds the quality unacceptable, her usual reaction is to stop buying that product. When a group of consumers stop buying, this boycott touches off a chain reaction that travels back through the channels of trade to the producer. The industry then is faced with a thorny problem, which centers around the difficulty of the buyer and seller--perhaps separated by the distance of a thousand miles or more--to achieve a meeting of the minds on the questions of quality and of a fair price based on the agreed quality.

Frozen fried fish sticks illustrated this problem. When fish sticks were first introduced to the consumer in 1953, this product met with immediate success, and sales boomed. As marginal processors entered the business, they cut corners, quality dropped, and the consumer found he could no longer rely on the quality or the uniformity of the product from package to package. The resulting buyers' resistance put some of the fish stick manufacturers out of business.

Three things are needed to resolve this producer-to-consumer marketing problem:

1. There must be some type of nationally recognized system for classifying the quality of the product.
2. The actual classification of the product must be the responsibility of an unbiased party.
3. The consumer needs some means (a) of identifying the products that are thus classified and (b) of ascertaining their relative standing with respect to the classification system.

### LEGAL BASIS OF INSPECTION

The producer-to-consumer marketing problem is not unique to the fishing industry. Agriculture, for example, has worked on a solution for many years. As a result of its ex-  
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U. S. DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service  
Sep. No. 693

perience, it found that legal aid is required. In this section, we accordingly consider the beginning of marketing legislation in agriculture and then its extension to the fishing industry.

**BEGINNING OF MARKETING LEGISLATION:** The United States Warehouse Act of 1916 was one of the first attempts to resolve the marketing problem through legislation. This act authorized, among other things, the investigation of warehousing, storage, the classification according to grade, and the certification of agricultural products. It also provided for Federal licensing of personnel to perform those duties.

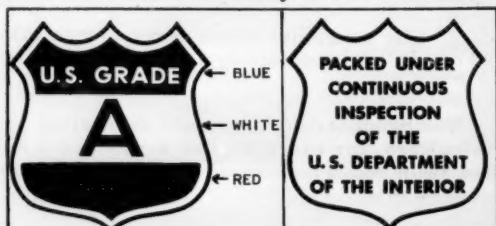
Between 1916 and 1946, various other laws were enacted that contributed to resolving the marketing problem. One of the most beneficial pertaining to the orderly marketing of agricultural products was the Agricultural Marketing Act of 1946, which contained the following significant provisions:

1. It provided for an integrated administration of all laws enacted by Congress regarding the resolution of marketing problems.
2. It gave the Secretary of the Department of Agriculture the authority to conduct continuous research to improve and determine the best methods of processing, packaging, handling, transporting, storing, distributing, and marketing agricultural products.
3. It provided for the development and improvement of standards of quality and condition in order to encourage uniformity and consistency in commercial practices.
4. It authorized voluntary inspection of products and certification of them as evidence of compliance with the product standard.

Product standardization thus is now recognized as being essential in the orderly marketing and efficient buying and selling of naturally-produced products. The need for the Federal Government to develop these product standards is that the problems in marketing are of national significance, and uniformity is needed for the transaction of interstate and foreign commerce. As was indicated earlier, standards have to be developed by an unbiased agency that is in a position to consider the problems from a national point of view--the processor, the distributor, and the consumer must all be considered. Furthermore, if the standards are to be practical, they must be uniformly interpreted. Independent judgment will always be required because of the inherent characteristics of natural products. Consequently, any program of product standardization, to be effective in commercial practice, must be accompanied by competent and unbiased inspection.

It is because Congress recognized the need for national action on product standards that it authorized the establishment of a voluntary inspection service to ensure that the standards would be uniformly applied. Technological advancements in agricultural production created competition in the industry, and product standardization and inspection developed at a steady pace as problems were met and overcome.

**EXTENSION TO THE FISHING INDUSTRY:** The fishing industry, however, did not immediately benefit. It was not until the passage of the Saltonstall-Kennedy Act in 1954 that funds were made available for scientists of the U. S. Fish and Wildlife Service to develop specific quality standards for fishery products. By 1956, the first United States standard for a fishery products--fish sticks--was developed and promulgated for the industry's use. Promulgation of the standard was carried out by the Department of Agriculture. Inspection of fishery products was also carried out by the Department of Agriculture, since at that time, the Department of the Interior had no such authority.



Shield using red, white, and blue background.

Shield with plain background.

Inspection and grading services for fishery products became the responsibility of the Department of the Interior in July 1958. At the outset of the fishery inspection program, 10 inspectors, trained in the inspection of fishery products, were transferred from the Department of Agriculture. These inspectors formed the nucleus of the USDI (U. S. Department of the Interior) inspection force. A supplemental capitalization appropriation obtained from Congress provided the necessary funds to get the program started.

### CURRENT STATUS

EXTENT OF SERVICE: Industry's acceptance of this program reflects the confidence of the industry in the Bureau and in the Bureau's desire to serve and assist. Currently, there are grade standards for 12 fishery products.

During the year ending June 30, 1963, over 210 million pounds of fishery products (mostly frozen, some fresh, and a few cured and canned) were inspected and certified. Of that amount, 185 million pounds were packed under continuous inspection. The other 25 million pounds were lot-inspected. Inspected products represent 32 percent of all fishery products domestically-produced for human consumption, exclusive of canned products. To handle this volume of inspection required the efforts of 54 inspectors located in 17 states. Inspection services are now provided in 41 processing plants on a continuous basis. In addition, lot inspection services are provided in nine major producing and marketing areas throughout the nation.

#### Voluntary Grades for Standards Now Available for Twelve Fishery Products

1. Fried fish sticks	7. Sole and Flounder fillets
2. Raw breaded fish portions	8. Halibut steaks
3. Fish blocks	9. Salmon steaks
4. Haddock fillets	10. Raw breaded shrimp
5. Cod fillets	11. Raw headless shrimp
6. Ocean perch fillets	12. Fried scallops

OBJECTIVES: The objective of the fishery inspection services is to aid all segments of the industry in the orderly marketing of wholesome products of high quality. During the past 2 years, the Bureau has found that a definite need exists to strengthen services to the con-

3-1961 Revised July 1962

NO. 79427

UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF COMMERCIAL FISHERIES

CERTIFICATE OF QUALITY AND CONDITION FOR FISHERY PRODUCTS

**CONTINUOUS INSPECTION**

This certificate is submitted to all buyers or private fish dealers evidence of the quality of the commercial products contained. This certificate does not cover products referred to the United Food and Drug Administration.

Shipper or Seller:  Address:

Receiver or Buyer:  Address:

I CERTIFY that in compliance with the regulations of the Bureau of Commercial Fisheries governing the inspection and certification of the products designated below, I inspected the samples of the products as shown below, and that the quality and condition as shown by the samples on the below date were as follows:

Where located:  Product inspected:  Number, size, and kind of containers:

Code or other identification marks on containers:

Principal title of label (if any):

Grade:

Remarks:

Per:  Date:   
Examiner:  Official Inspector:   
Fwd.:  Address:

PLEASE REFER TO THIS CERTIFICATE BY NUMBER



3-1961 July 1962

UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF COMMERCIAL FISHERIES

CERTIFICATE OF QUALITY AND CONDITION  
FOR FISHERY PRODUCTS

LOT No. 2

INSPECTION

This certificate is submitted to all buyers or private fish dealers evidence of the quality of the commercial products contained. This certificate does not cover products referred to the United Food and Drug Administration.

Applicant	Address
Shipper or Seller	Address
Product Inspected	Source, number and size of samples
Where located	Code marks on containers
Principal title of label	
Grade:	
Remarks:	
Per: <input type="text"/>	I CERTIFY that in compliance with the regulations of the Bureau of Commercial Fisheries governing the inspection and certification of the products designated below, I inspected the samples of the products as shown below, and that the quality and condition as shown by the samples on the above date were as follows:
Examiner: <input type="text"/>	Address of Inspection Office
Fwd.: <input type="text"/>	Signature of Inspector

PLEASE REFER TO THIS CERTIFICATE BY NUMBER AND INSPECTION OFFICE

sumer. To meet this need, we have made the standards more exact and have placed more emphasis on better plant sanitation.

We believe that a program geared both to the needs of the industry and the desires and expectations of the consumer will achieve our goal of increased production and consumption of fishery products of high quality, the achievement of which will benefit both our citizens and our fishing industry.

**CHANGES:** We have made other changes in the inspection program largely as a result of the recommendations made during the Industry-Government Inspection Conference held in Washington, D. C., in June 1961. Suggestions that were made by the industry and that have been implemented include the following: (1) inspection certificates have been redesigned to differentiate clearly between continuous inspection and lot inspection; (2) the inspection regulations have been amended, streamlining recovery of costs for services rendered and achieving greater uniformity in the assessment of fees and in the methods of charging; (3) a formal communication system has been established whereby all proposed inspection policies are made available to the processors for their consideration and comment prior to adoption; (4) regulations have been established with regard to stripping labels bearing Federal shields from mislabeled products.

**PROBLEMS:** The Standards and Inspection Program is not without its problems. Consumers' Union, for example, has been critical of the over-all quality of fish sticks, breaded shrimp, and frozen fish fillets. The Bureau is in the process of tightening those standards to assure that better products reach the market. Another problem is the loss of quality during distribution. Work is under way to find how time and temperature fluctuations affect the quality of the products as they move through the distribution channels. Another problem is to maintain uniformity in the application of standards by USDI inspectors. The Bureau is using several approaches to overcome this difficulty.

**TYPES OF SERVICES AVAILABLE:** At present, three major types of inspection services are provided by the Bureau.

1. **Continuous Inspection:** The continuous inspection service provides that an inspector shall be stationed at the plant during all shifts of the processing operation.
2. **Lot Inspection:** The lot inspection service provides that a specific lot of product designated by the applicant will be officially sampled, examined, graded, and the results certified.
3. **Cross-Use of Other Federal Inspection Service:** Federal inspection service is provided in conjunction with the Department of Agriculture to processors of both agricultural and fishery products.

Many food processors have taken advantage of technological advances and are producing a wide variety of products from agricultural and fishery sources. In a plant equipped to produce TV dinners, for example, the processor needs only to change the raw material input to produce packaged beef, poultry, or fish dinners. To make Federal inspection services economically available to producers of diversified products, the Departments of Interior and Agriculture cross-license inspectors of the cooperating agency and thereby make possible an inspection service for all products with a single inspector at a given plant in most instances.

#### BENEFITS OF INSPECTION

In this section, we first consider the services performed by the USDI inspectors and then the other benefits of inspection and certification.

**SERVICES OF USDI INSPECTORS:** The inspector's services vary according to the type of inspection requested. In the following presentation, the major responsibilities of the inspector are considered in terms of the value of the service to the processor at the plant.

Sanitation Expert: The first responsibility of the inspector is to act as a sanitation expert. He pinpoints and recommends ways to correct factors that may contribute to an unsanitary condition in the plant or that may result in the packing of a product containing foreign matter that is repulsive to the consumer or injurious to health. One of the inspector's primary functions is to see that a minimum amount of the product is classified as defective due to an unsanitary operation.

Experience has shown that the maintenance of good sanitary conditions makes a positive contribution to production in terms of value to the processor. The added discipline brought about by a good sanitation program spreads to other phases of the operation. The inspector's positive philosophy in that regard together with support by plant management improves the attitude and efficiency of the workers in the plant, minimizes losses brought about by spoilage of materials, and reduces the cost of operation.

Quality-Control Adviser: The second responsibility of the inspector is to act as a quality-control adviser. His function in this regard is to ensure that the quality of the raw material and of all components that go into the finished product are such that the resultant product will be wholesome. This function is of tremendous value to the processor. A number of instances have been reported where plants have received large quantities of frozen fish that did not meet the buyer's specifications. Upon the strength of the inspector's certification, the product was not accepted at the plants, thus saving the processor both time and money.

This role performed by the inspector can result in the development of interesting situations. For example, a report was received stating that a lot of frozen fish had been rejected for processing by one of our inspectors. Later, at another plant several hundred miles distant, a different inspector reported that he suddenly discovered a drastic decrease in the quality of the fish on the processing line. Upon investigation, he found that without his knowledge, there had been a change in the lot of frozen fish being processed. It turned out that the fish that had been rejected previously by the first inspector had been delivered to the second plant for processing and was again rejected. This action serves to illustrate the high level of uniformity and competency that the Bureau is working to achieve throughout the inspection service.

Observer: The third responsibility of the USDI inspectors is that of the friendly observer. He provides continuous surveillance throughout the plant during processing operations. His functions are to assist in maintaining a uniform product, to prevent any reduction in the quality of the product, and to eliminate any other factor or condition that may affect its marketability. Throughout the operation, he is concerned that the product is kept clean, uniform, and continuously moving. There are many ways in which this constant surveillance is of value to the processor. The following are but a few examples of instances where inspectors have provided assistance to the plant manager by calling his attention to situations such as:

1. A toilet--clogged and overflowing.	5. The malfunctioning of a recording thermometer.
2. A printing error on the product label.	6. Breading materials infested with insects.
3. Product containers being ruptured in the packaging machine.	7. Spoiled component materials.
4. Packaged products that were under-weight.	8. Foreign material entering the product.
	9. Off-odor products on the packaging line.

Quality Assessor: The fourth responsibility of the USDI inspector is to sample the finished product and apply the appropriate standard or other buying specification. In performing this function, the inspector evaluates the over-all quality of the product and determines the degree to which it complies with the requirements of the pertinent document. This service is, of course, invaluable to the processor in that he receives an unbiased determination of the class, quality, quantity and condition of his product. He is also alerted to many additional factors that affect its marketability.

Reporter: The fifth responsibility of the inspector is to report significant information to the plant manager. The following is typical of the kind of information given:

1. Reports of sanitation inspection, including recommendations for corrective action.
2. Reports regarding the condition, quality, and net weight (or count per pound in the case of frozen raw shrimp) of raw materials.
3. Certificates of quality and/or condition of all inspected products.
4. Reports of daily inspection of all products produced under inspection.
5. Product score sheets, which identify and indicate the frequency and severity of the specific factors that contribute to low quality of product or to poor workmanship.

OTHER BENEFITS OF INSPECTION AND CERTIFICATION: In addition to the value of inspection service at the plant level, inspection aids the processor in other ways, such as the following:

1. Product certification ensures, in large measure, the salability of the product.
2. Certification helps the processor to assure the buyer that he is getting a product of high quality.
3. Official certificates are accepted in all the courts in the land as *prima facie* evidence of fact. They are of primary importance therefore in the settlement of legal disputes or in the establishment of legal claims in cases of damaged merchandise.
4. Certificates of quality, together with warehouse receipts, can be used in obtaining inventory loans. The processor, in making application for a loan, can provide complete information with regard to the quality, the quantity, the value, and the expected shelf life of the product.
5. Of very significant benefit to the processor is the use of inspection symbols on labels and advertising material to promote consumer confidence and acceptance. The inspection shields become more meaningful to the housewife and to the institutional buyer as they recognize the inherent advantages of a standardized product of uniformly high quality. The stamps of government inspectors on a variety of products have long been used to assure the buyer of the purity, wholesomeness, and adherence to recognized standards and specifications of these products. The shields of quality used by the USDI now serve the same function in the field of fishery products.

#### COST OF VOLUNTARY INSPECTION TO THE PROCESSOR

Except for the initial money appropriated for the establishment of the Inspection Program, the Inspection and Certification Service has operated essentially by means of reimbursements for services rendered. The services performed at the plant and the additional benefits have an estimated value of \$20,000-\$25,000 to the plant per inspector per year. The actual cost for inspection services is a minimum of \$9,250 per inspector per year. In most plants, this added cost to production varies between  $\frac{1}{4}$  to  $\frac{1}{10}$  of a cent per pound of fish processed in plants having an annual output of 3.5 to 16 million pounds. The cost thus actually is relatively small in comparison with the over-all value of the service to the processor.

#### FUTURE EXPECTATIONS OF THE INSPECTION SERVICE

There is no magic market for inspected fishery products. The law of supply and demand works on those products just as it does on products that are not inspected. The inspected products, however, do have a sales advantage in that the buyer has greater confidence in the product.

The Bureau has a dual responsibility in much of its work, and the inspection service is no exception. We must help to further the interest of the domestic fishing industry. At the same time, we are responsible to the consumer for encouraging him to purchase fish by building his confidence in products of predictably good quality at a fair price. The fact that the United States firms that produce 75-80 percent of the breaded shrimp and 65-70 percent of the fish sticks and portions have accepted this inspection service speaks well for progress on the first responsibility. On the consumer's side, such groups as state and Federal purchasing agents, distributors, and chain-store buyers have exhibited confidence in our service even to the extent of requesting the development of more standards and specifications and increased inspection service.

The USDI Fishery Inspection and Certification Service thus has now proved its value both to the consumer and to the fishing industry over a period of 5 years. We can expect, therefore, that it will continue to grow. As it does so and as we gain further experience, we can expect that it will be of even greater value to the consumer and to the industry than at present.

#### SUMMARY

Both the consumer and the industry have needed a nationally-recognized system for classifying the quality of packaged fishery products.

The legal basis for the establishment of such a system had its inception in the United States Warehouse Act of 1916 and was further strengthened by subsequent legislation in which the Agricultural Marketing Act of 1946 was a landmark.

The passage of the Saltonstall-Kennedy Act of 1954 then made funds available to develop standards for fishery products. Inspection and grading services became the responsibility of the Department of the Interior in July 1958. The objective of the service is to aid in the orderly marketing of wholesome products.

Currently there are grade standards for 12 fishery products. During the year ending June 30, 1963, over 210 million pounds of fishery products were inspected and certified--this represents 32 percent of all fishery products domestically-produced for human consumption exclusive of canned products.

The types of inspection available include continuous inspection and lot inspection. Also available is inspection of both agricultural and fishery products in the same plant. In providing these services, the inspectors have five basic responsibilities: they act as (1) sanitation experts, (2) quality-control advisers, (3) observers, (4) quality assessors and (5) reporters.

The services performed by the inspectors and the related advantages of the inspection system have an estimated value of \$20,000-\$25,000 to the plant per inspector per year. The cost for the service runs about \$9,000 per inspector per year.

Note: The following are available without charge from the Office of Information, U. S. Fish and Wildlife Service, Washington, D. C. 20240: Copies of U. S. Standards for Grades of Fishery Products, Regulations Governing Processed Fishery Products, and reprints of this article.



Created in 1849, the Department of the Interior--America's Department of Natural Resources--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



# TRENDS AND DEVELOPMENTS

## Alaska

### FOREIGN FISHING ACTIVITIES IN THE BERING SEA AND GULF OF ALASKA:

The month of August 1963 marked a further reduction in foreign fishing activities off the coast of Alaska. By the end of that month, all Japanese whaling fleets had returned to Japan and the Soviets had made a very substantial reduction in the size of their trawl fleet fishing for Pacific ocean perch. It was estimated that there were about 80 Russian and 150 Japanese vessels fishing in the Bering Sea and Gulf of Alaska as August drew to a close.

U.S.S.R.: The Soviet trawl fleet continued to operate on the Portlock-Albatross Banks area near Kodiak. The fleet, however, was drastically reduced to about 50 vessels during August. The reason for the sudden reduction in fleet strength was somewhat surprising to United States observers, as Soviet vessels were making substantial catches of Pacific ocean perch.

Two Soviet whale-processing fleets continued to operate in waters adjacent to Alaska during August, and killer vessels were still being sighted close inshore. One fleet operated along the eastern part of the Aleutian Island Chain while the second fleet operated south of the Alaska Peninsula throughout most of August.

Japan: The three Japanese whaling fleets that operated off Alaska during the current season had filled their quotas and departed for Japan by early August.

Two Japanese factoryships, accompanied by 4 trawler-type vessels and 16 "Kawasaki" type picker boats, were engaged in fishing for king crab in Bristol Bay northwest of Port Moller. The Japanese shrimp fleet fishing north of the Pribilof Islands consisted of a single factoryship and 15 trawlers.

The long-line fleet then fishing southeast of the Pribilof Islands was believed to consist of 5 factoryships and about 70 trawlers. One factoryship was scheduled to depart for Japan during late August.

\* \* \* \* \*

### ALLEGED VIOLATION OF TERRITORIAL WATERS BY FOREIGN VESSELS PROTESTED:

Alaska senators protested alleged violations of territorial waters by Soviet whale killer vessels, and Alaskan military authorities were asked to furnish additional protection against incursions by foreign vessels into the waters of the State. Several reported violations of territorial waters by both Soviet and Japanese vessels created a storm of protest from the Alaska Congressional Delegation, Alaska's Governor, and members of the fishing industry.

\* \* \* \* \*

### EMERGENCY REGULATIONS ISSUED TO PROHIBIT ALIENS FROM FISHING IN TERRITORIAL WATERS:

The Alaska Department of Fish and Game issued emergency regulations in response to reported violations of territorial waters by foreign vessels. The new regulations prohibit aliens not lawfully admitted to the United States from engaging in fishing or whaling activities within territorial waters. Violation of the regulations would carry a penalty of up to \$5,000 and/or 6 months imprisonment as well as seizure of gear and vessel.

\* \* \* \* \*

### TRAINING COURSE FOR FISHERMEN PROPOSED:

The Ketchikan committee on the Manpower Development and Training Act decided to submit a proposal under the Act for a "Fishermen's Course" to upgrade skills of Alaskan fishermen. The proposed course would be

offered by the Ketchikan Community College and would include a total of 52 weeks of instruction divided into two 26-week periods with the seasonal salmon fishery intervening. The course would cover the same subject areas previously offered in two "Fishermen's Short Courses" conducted by the University of Alaska in cooperation with the U. S. Bureau of Commercial Fisheries Technological Laboratory at Ketchikan. In addition, practical experience aboard fishing vessels chartered by the school would be included.

\* \* \* \* \*

#### SHRIMP-PACKING OPERATIONS CURTAILED:

As the 1963 summer season neared an end, certain shrimp processors in the central Alaska region were reportedly preparing for a cut-back in operations. At the end of August, 4 vessels were landing shrimp at Seward and 2 at Seldovia. No shrimp were being landed at Kodiak where two plants had been geared-up earlier this year. At Seward, production consists of frozen shrimp logs; at Seldovia it is canned shrimp; and at Kodiak facilities are available for both the canned and frozen shrimp products. According to sources in the areas, the Seldovia operation was scheduled to close as usual about October; the Seward operation was due to cease in November; and at Kodiak there appeared to be no plans for activating the shrimp plants. It has been reported that one shrimp vessel serving the Seward packing industry will be converted to crab fishing. Curtailment of production of shrimp was attributed to the depressed market for the Alaskan products brought about, it was conjectured, by the increased production of other established sources of supply in the "lower 48" States.

\* \* \* \*

#### COMPOSITION OF 1963 ALASKA SALMON PACK:

As of August 25, the composition of the 1963 Alaska salmon pack was predominantly pink salmon. The percentage composition by species at that time was pinks 62 percent, reds 19 percent, chums 15 percent, cohos 3 percent, and kings 1 percent. Comparative figures through August 26, 1962, were pinks 54 percent, reds 23 percent, chums 19 percent, cohos 2 percent, and kings 2 percent.

The pack of salmon in Western Alaska as of August 25, was 291,000 cases compared

with 512,000 cases packed at that time a year earlier. The 1963 season in western Alaska was the worst recorded since 1935 when the pack totaled 277,000 cases.

Considering that Central Alaska had a record salmon catch in 1962 with a pack of 1,975,000 cases packed as of August 26 of that year, the 1963 season's pack of 1,145,000 cases as of the end of August was considered to be about normal.

Pink salmon were abundant in Southeastern Alaska and canneries were going full time. As of of August 25, 1963, the pack climbed to 1,102,000 cases as compared with 579,000 cases for the same period a year earlier.

\* \* \* \* \*

#### AIRBORNE CRAB SHIPMENTS FROM YAKUTAT:

Yakutat, a small community of 250 persons, located on Yakutat Bay in the Gulf of Alaska, has shipped more than 100,000 pounds of processed fresh crab (equal to about 300,000 pounds of whole crab) to seafood distributors in Seattle, Wash., and San Francisco, and Los Angeles, Calif. The crab meat is vacuum packed in specially designed containers which hold 5 pounds each. Cartons containing 6 such containers are air-shipped approximately 3 times weekly in 3,000 pound lots to Seattle. Dungeness crab accounts for about 75 percent of the shipments, and king crab the remainder.

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#### SALMON CAVIAR FROM ALASKA SHIPPED TO JAPAN:

The Japanese vessel Banshee Maru No. 32 was reported to have picked up 10 tons of salmon caviar which was manufactured in Kodiak, Alaska. The experimental shipment was taken directly to Yokohama, Japan. The potential Japanese market for Kodiak salmon roe may exceed several hundred tons per season. In the past, the bulk of the Japanese supply of salmon caviar has been obtained from the Soviet Union; however, the Japanese have indicated a desire to purchase the product from Alaska.



## Alaska Fisheries Exploration and Gear Research

### SHRIMP DISTRIBUTION STUDIES IN GULF OF ALASKA CONTINUED:

M/V "Yaquina" Cruise 63-2 (July 8-September 11, 1963): Exploratory fishing for shrimp was conducted along the northern perimeter of the Gulf of Alaska between Prince William Sound and Chirikof Island during this 9-week cruise by the U. S. Bureau of Commercial Fisheries chartered fishing vessel Yaquina. Work was done to supplement previous explorations in the area, as well as to provide coverage at locations not previously sampled.

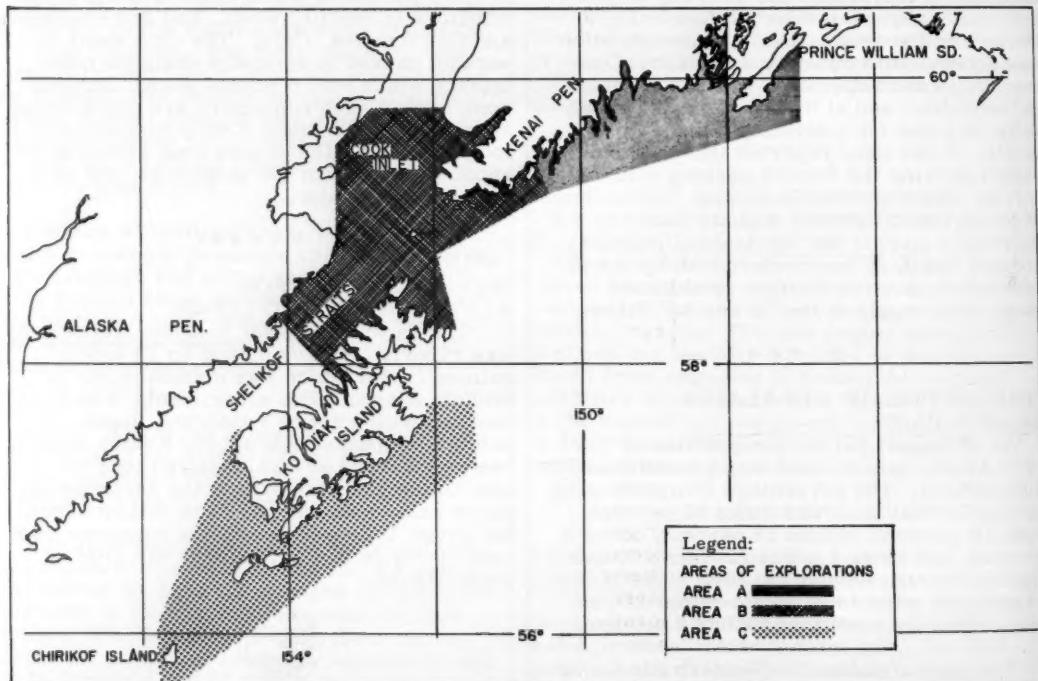
Evaluation of the potential resources was made by fishing selected areas with experimental trawl gear. The basic sampling gear used during the cruise consisted of 40-foot regular flat shrimp trawls, with 1½-inch mesh in the intermediate and body section, and 1 5/8-inch mesh in the bag section. The footrope was hung with a loop chain, and 6 deep sea aluminum alloy floats were attached to the headrope. The nets were fished with 5-foot

Summary of Shrimp Catch Data during <u>Yaquina</u> Cruise 63-2				
Species of Shrimp		Average Catch of Shrimp Per Trawl Drag		
Common Name	Scientific Name	Area		
		"A"	"B"	"C"
Pink Shrimp	<i>Pandalus borealis</i>	19.6	163.7	251.4
Side-stripe	<i>Pandalopsis dispar</i>	2.3	37.3	26.9
Humpy	<i>Pandalus conicus</i>	-	7.3	58.0
Coon stripe	<i>Pandalus hypsinotus</i>	0.5	14.2	14.5
Other Species		0.1	0.7	4.4
Total . . . . .		22.5	223.2	355.2

otter boards suspended from 25-fathom bridle and towed from a single trawl warp. The average length of each trawl drag was 30 minutes.

The cruise was divided into three sampling areas. Area "A" consisted of waters between Prince William Sound and Nuka Passage (West of Seward); Area "B" included those waters adjacent to the Kenai Peninsula, the Barren Islands, and portions of Kachemak Bay, Lower Cook Inlet and the Shelikof Straits; and Area "C" covered the waters east and south of Kodiak Island.

In Area "C", catches of up to 3,000 pounds of pink shrimp were taken during a single



M/V Yaquina Cruise 63-2 (July 8-September 11, 1963).

drag off Twoheaded Island. A total of 64 trawl drags in the area produced an average of over 350 pounds of shrimp per drag. The largest catch of side-stripe shrimp from an individual drag (630 pounds) was taken in Alitak Bay.

In Area "B," 91 trawl drags were completed, yielding an over-all average shrimp catch of approximately 220 pounds per drag. Individual tows produced as high as 2,000 pounds of pink shrimp and 420 pounds of side-stripe shrimp. There were consistently high catch rates for side-stripe shrimp in northern Shelikof Straits.

The catch rates in Area "A" were significantly lower than those to the westward. The largest individual catch in this area was only 130 pounds of pink shrimp caught near Seal Rocks off Seward. Attempts to repeat high catch rates previously encountered during exploratory fishing off Montague Island were not successful.

Side-stripe shrimp averaged 21-30 whole shrimp per pound. Pink shrimp, which in the aggregate accounted for over 70 percent of the total catch, ranged in size from less than 50 to over 150 shrimp per pound, most of those, however, were 60 to 80 count (heads-on).

Note: See Commercial Fisheries Review, October 1963 p. 15.



### Alaska Fishery Investigations

#### LOW WATERS IN SOUTHEASTERN ALASKAN STREAMS HAVE DIFFERENT EFFECTS ON DISSOLVED OXYGEN:

This year, levels of dissolved oxygen in Sashin Creek at Little Port Walter were significantly higher, and levels of free carbon dioxide and ammonia nitrogen lower than during the 1962 summer. The improved conditions occurred in spite of extremely low stream flows and warm water temperatures. One major difference between the summer of 1962 and 1963 was the presence of decaying eggs in the gravel during the former period and their absence during the most recent summer. Controlled experiments have been started by the U. S. Bureau of Commercial Fisheries Auke Bay Biological Laboratory, to determine the effect of dead eggs on water quality.

In contrast to Sashin Creek, and concurrent with the extreme low flows in Southeast Alaska, the dissolved oxygen was critically low in Traitors Cove Creek. This resulted in severe mortalities in the early run chum salmon eggs. Traitors Cove Creek gravel did not have any significant burden of decaying eggs from the previous brood year. Dissolved oxygen levels are important to the survival of salmon eggs and apparently may become critical during summer low stream flows in some Southeast Alaska streams, but not in others.

\* \* \* \* \*

#### RED SALMON MOVE SLOWLY UP KARLUK RIVER:

Adult red salmon tagged at Portage weir in the Karluk River took, on the average, 150 hours to move 9 miles up stream to the Karluk Lake weir. The fastest migration took 16½ hours and the slowest 312 hours. The rate of migration seemed to vary inversely with the numbers of fish present in the river; that is, the fish seemed to slow down as their numbers increased.



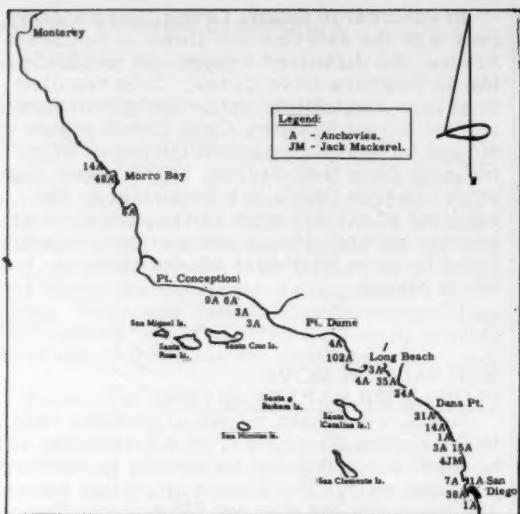
### California

#### PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 63-8 (August 19-21, 1963): The survey to determine the inshore distribution and abundance of pelagic fish schools was continued by the California Department of Fish and Game Cessna "182" 9042T during flights over the inshore area from the United States-Mexican Border to Point Piedras Blancas, Calif.

Weather and visibility were generally poor and only afternoon flights were possible during the days scheduled. Water clarity was excellent south of Point Conception, but turbid in the Morro Bay area. The clear water sometimes made it difficult to distinguish fish schools from shoals and kelp beds. Very little red tide was seen, but where it did exist, it was concentrated in small areas and generally quite dense.

A total of 359 anchovy schools and 4 jack mackerel schools were sighted during the 3 afternoons. The first day's flight was the



Pelagic fish survey flight 63-8.

most productive with 102 schools sighted in Santa Monica Bay, 61 in the Point Vicente to Dana Point area, and 86 between Dana Point and the United States-Mexican Border.

Los Angeles Harbor bait fishermen have mentioned that anchovies quite often can be seen during the day in the channels of the "inner" harbor. The area was checked closely and three schools were seen among the moored boats. It has been said that those fish move into the outer harbor at night. No schools were seen in the outer harbor. A San Diego bait boat was seen making a set off Coronado Strand. Thirty-eight anchovy schools were counted in the immediate area. The bait fleet had difficulty locating anchovies in that area during previous months.

Four jack mackerel schools were seen off Encinitas near several purse seiners. None of the vessels was actively making a set.

On August 20, the area north of Los Angeles was flown, but visibility was very poor to Point Conception. North of the Point, the haze lifted and scouting was continued to Point Piedras Blancas. Anchovy schools seen around Morro Bay numbered 68.

On August 21, the entire area from Point Conception to the Mexican Border was scouted again. The Santa Barbara area still was enshrouded in haze, and fog. The condition prevailed down the coast to Los Angeles

Harbor. South of Los Angeles, the air was clear and 42 anchovy schools were seen. Note: See Commercial Fisheries Review, September 1963 p. 14.

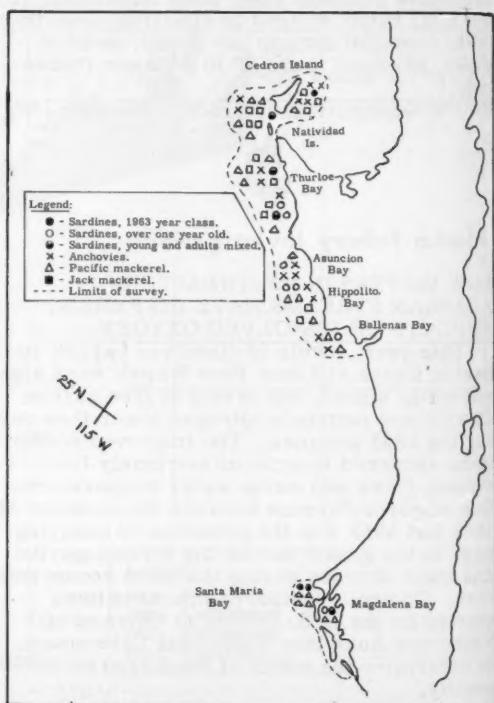
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**M/V "Alaska" Cruise 63-A-5 (August 6-27, 1963):** The objectives of this cruise by the California Department of Fish and Game research vessel Alaska off the Mexican coastal waters of Baja California from Magdalena Bay to Cedros Island were to:

(1) Survey the fish and invertebrates in the inshore pelagic environment.

(2) Determine the amount of recruitment from this year's spawning of Pacific sardines (*Sardinops caeruleus*) and to measure the population density of older fish.

(3) Determine the distribution and abundance of northern anchovies (*Engraulis mordax*), Pacific mackerel (*Scomber diego*), and jack mackerel (*Trachurus symmetricus*).

M/V Alaska Cruise 63-A-5, August 6-27, 1963.

(4) Continue evaluating the midwater trawl under a variety of conditions.

(5) Collect live sardines and broomtail groupers (*Mycteroperca xenarcha*) for age, growth, and serology studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla, Calif.

The midwater trawl, a blanket net, and visual scouting were used during the survey. A total of 35 night-light stations were occupied with a blanket net and the midwater trawl was used at 33 stations. Visual scouting was carried out for 271 miles. The principal fish species taken were northern anchovies, Pacific mackerel, jack mackerel, Pacific round herring (*Etrumeus teres*), and sardines. Over 32 other species were taken in lesser quantities, the most common of which were Pacific pompano (*Palometa simillima*), slim midshipmen (*Porichthys myriaster*) and northern midshipmen (*P. notatus*). The invertebrate catch consisted almost entirely of various squids, pelagic red crabs (*Pleuroncodes planipes*), salps, and pyrosomes.

**PACIFIC SARDINES:** Sardines were taken at various scattered locations within the cruise area. Fish of the 1963 year-class were frequently mixed with adults and made up slightly less than one-third of the total sardine catch. It appears that the 1963 year-class is similar to the poor one spawned in 1962.

The midwater trawl took sardines in 10 of 21 night tows and the blanket net at 4 of the 35 night-light stations. The best catches were made in Magdalena Bay where sardines were taken on all three night tows attempted. Many small schools were also observed in that area during daylight hours. Only 11 sardine schools were sighted during night scouting, all in the vicinity of Thurloe Bay.

**NORTHERN ANCHOVIES:** Anchovies were by far the most abundant pelagic fish taken or observed. They were found in an unbroken stretch from Ballenas Bay to Cedros Island. Extremely heavy concentrations were present near Natividad Island and Asuncion Bay. In those areas, schools were grouped so closely it was difficult to count them separately. The midwater trawl took anchovies in 14 of 18 tows. Most of the fish sampled were small (under 100 millimeters), but the 2 areas of heaviest concentrations contained large adults (115-140 millimeters). During visual scout-

ing at night, 174 schools were detected. Many more indications of their presence were observed during daylight hours and on echosounder traces.

**PACIFIC MACKEREL:** Pacific mackerel were distributed over the entire area. They were present at 9 of 35 night-light stations and in 12 of 21 night trawls. But individual catches were limited except at night-light stations in Santa Maria Bay. The bulk of the catch appeared to be fish-of-the-year.

**JACK MACKEREL:** Jack mackerel were distributed from Ballenas Bay to Cedros Island. They were taken by trawl and night-light fishing at almost the same rate as Pacific mackerel. The catch consisted chiefly of fish less than 1 year old. The young jack mackerel frequently were schooled with sardines and Pacific mackerel.

**MIDWATER TRAWL EVALUATION:** The midwater trawl functioned very effectively in sampling pelagic fish species. It never failed to take fish that had been detected beforehand, and many times made catches where there had been no evidence of fish. The size of the fish caught by the trawl ranged from 2-inch anchovies to 35-pound white sea bass (*Cynoscion nobilis*). The number of species and the frequency at which they were taken by the trawl far exceeded the blanket-net catches. The trawl was much more effective than the blanket net in sampling anchovies. It made 15 catches as compared to 1 for the blanket net. Sardines and jack mackerel were more thoroughly sampled by the trawl, but no appreciable difference was evident with Pacific mackerel.

Night tows consistently caught more than day tows, especially of the important pelagic species. The difference was large enough to suggest that only night tows be made on future surveys. The best catches were made within 60 feet of the surface in turbid water. The latest modification of the net (shortened wings) resulted in a substantial improvement in door spread and ease of setting.

**MISCELLANEOUS OBSERVATIONS:** Live broomtail groupers were collected at Magdalena Bay for blood serology studies by the U. S. Bureau of Commercial Fisheries.

Trolling for albacore off northern Baja California failed to produce catches.

Weather and sea conditions were good at all times in the survey area. Sea surface temperatures ranged from 64.85° F. (18.25° C.) at Thurloe Bay to 75.90° F. (24.40° C.) at Hipolito Bay.

Note: See Commercial Fisheries Review, September 1963 p. 17.

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#### ABALONE OBSERVATIONS AND GROWTH STUDIES:

M/V "N.B. Scofield" and M/V "Mollusk" Cruise 63-S-5 and 63-M-1 Abalone (August 1-22, 1963): The objectives of these cruises by the California Department of Fish and Game research vessels N.B. Scofield and Mollusk along the mainland coastal areas of San Simeon and Morro Bay, and the Channel Islands of San Miguel, Santa Rosa, San Clemente, and Santa Catalina were to:

(1) Examine abalone beds in the San Simeon area in order to determine the effects of sea otters;

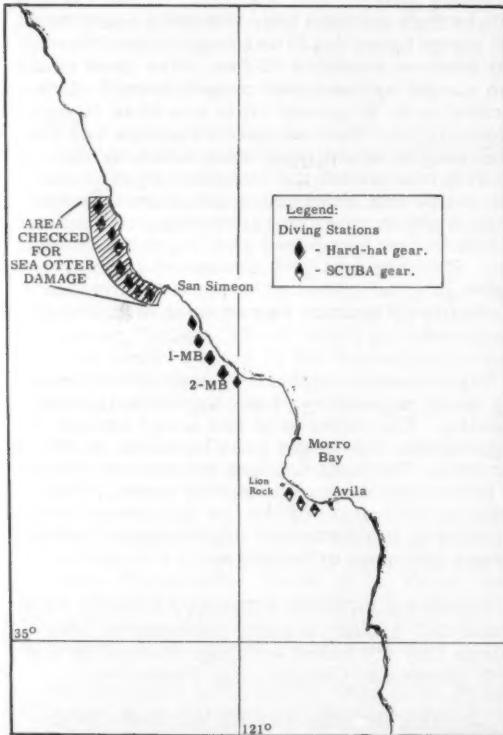


Fig. 1 - Shows diving stations off San Simeon, Morro Bay, and Avila during Cruises 63-S-5 and 63-M-1 by research vessels N. B. Scofield and Mollusk.

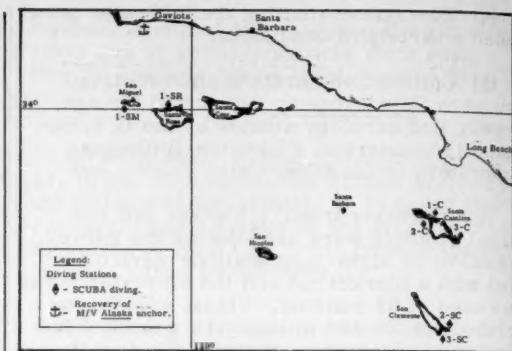


Fig. 2 - Shows diving stations in the Channel Islands during Cruises 63-S-5 and 63-M-1 by research vessels N. B. Scofield and Mollusk.

(2) Examine areas in the vicinity of Morro Bay and Avila to determine the extent of abalone;

(3) Check established abalone-observation stations at the Channel Islands, and tag abalone for continued growth study; and

(4) Conduct shipboard experiments designed to induce abalone spawning in tanks in order to obtain larvae for study.

**SEA OTTER DEPREDATION:** A special field trip was conducted in the San Simeon area (figure 1) with representatives of the abalone commercial fishery to determine the effects of sea otters on the abalone beds. Dives were made in areas where sea otters had been reported and in areas where sea otters were present. Broken shells, characteristic of sea otter depredation, were present in all areas where abalone were found. The amount of broken shell appeared to be in direct proportion to the numbers of abalone. An estimated 20 to 30 sea otters were in the area. While it was impossible to place a numerical figure on the amount of depredation, it was obvious that otters had been taking abalone and represented serious competition to divers on the same beds.

**DISTRIBUTION AND GROWTH OBSERVATIONS:** Morro Bay-Avila: Abalones here (figure 1) showed well developed gonads and appeared to be within 2 to 3 weeks of spawning. The gonads of the larger specimens (190-228 millimeters) were better developed than those of the smaller ones (178-188 millimeters). Many showed little or no shell growth in contrast with last year when most abalone had added 1 to 2 centimeters of new growth.

Spot dives were made along the coast north of Avila to obtain data for comparison with

observations made on last year's cruise. Specimens were found only in the Lion Rock area although the bottom and kelp appeared suitable for abalone in most places.

**SAN MIGUEL:** Bottom conditions at station 1-SM (figure 2) were much the same as those observed in 1962. Considerable sand still remained, but kelp growth had not been inhibited to any extent. Several large areas were thickly covered with sea urchins. At the eastern and western ends of the station, abalone was scarce, although they were plentiful in the central section. Samples were taken for transplanting to Santa Catalina Island. The water was thick with plankton (mostly salps) and dense schools of minute shrimp.

Ninety-two specimens (165 to 234 millimeters in length) had gonad tissue in stages of development from very early to nearly maximum maturation. Observations indicated that most of the abalone in the area might have recently spawned. A few showed recent shell growth.

**SANTA ROSA (STATION 1-SR):** A total of 20 tagged black abalone were recovered from a group of 130 marked in 1961. They showed no evidence of migration and no appreciable growth between September 1961 and August 1963. Other tagged shells were seen that could not be recovered due to heavy swells. With favorable weather, 50 to 75 percent of the original 130 could probably have been recovered.

In a shallow bay adjacent to the station, a school of over 1,000 leopard sharks was observed. The sharks are reported to congregate in the area during summer.

**SAN CLEMENTE:** Abalone were less numerous at stations 2-SC and 3-SC (figure 2) than a year ago, and growth during the year had been very slight. Gonad samples indicated that some were spent. Others had not developed and would not spawn this year.

Dives were made to 100-105 feet, but only a few pink abalone were found at those depths. Kelp growth was moderate and about the same as in 1962.

**SANTA CATALINA:** Abalone at station 2-C (figure 2) in Catalina Harbor were not as numerous as last year. The bottom appeared to have undergone considerable change. Large rocks and boulders were piled over the bot-

tom, probably the result of storms. Eight marked abalone were recovered; 5 had been released in 1958 and 3 in 1962. Growth ranged from 0-18 millimeters. All were recovered at approximately the same depth and in the area of release, except 1 which had moved from 25 into 50 feet of water.

Numerous abalone of all sizes were found on the undersides of rocks and boulders, buried in 6 to 10 inches of sand and gravel. The abalone appeared to be dormant. How long they remain under the rocks is unknown.

At station 1C (Isthmus Reef), 39 red abalone from San Miguel were tagged and placed in water 100-105 feet deep off the side of the reef in the same general area to which survivors of the first red abalone transplant in 1957 had moved. The water at that depth is 4 to 5 degrees cooler (58° C.), and elk kelp (*Pelagophycus porra*) rather than giant kelp (*Macrocystis pyrifera*) is the dominant species.

At station 3-C (Avalon Harbor), approximately 30 tagged abalone released in 1957 and 6 shells of abalone tagged in 1958 were recovered. One live pink abalone tagged in 1958 and released in 25 feet of water was recovered at a depth of 80 feet. When tagged, it measured 140 millimeters, and when recovered, 150 millimeters. The station looked much better than in 1962. More kelp was growing and more fish and invertebrates were present, although the abalone population had not increased appreciably.

**HOLDING EXPERIMENTS:** Attempts to keep abalone alive in tanks aboard ship were not successful. Several methods of circulating and aerating sea water were tried without success. None of the abalone survived more than 24 hours, and all attempts to induce spawning were unsuccessful.

Note: See *Commercial Fisheries Review*, December 1962 p. 25.



## Cans--Shipments for Fishery Products, January-July 1963

A total of 1,763,139 base boxes of steel and aluminum was consumed to make cans shipped to fish- and shellfish-canning plants in January-July 1963, a decline of 3.5 percent from the 1,826,186 base boxes used dur-



during the same period in 1962. Most of the decline was due to a smaller pack of tuna in the first part of 1963.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 21.8 base boxes per short ton of steel. The use of aluminum cans for packing fishery products is small.



## Central Pacific Fisheries Investigations

### OCEANIC EDDY SOUTHEAST OF OAHU SURVEYED:

M/V "Charles H. Gilbert" Cruise 68 (August 21-29, 1963): To locate and study one of the major eddies downstream of the Hawaiian Islands, in order to determine currents within the eddy as a unit, and to study the changes

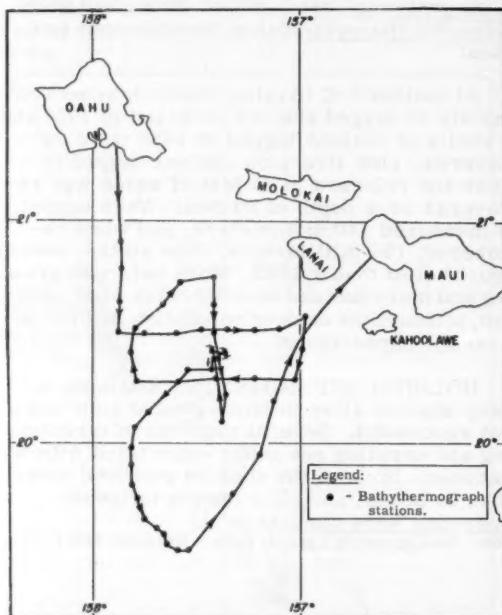


Fig. 1 - Cruise 68 track, Phase I, M/V Charles H. Gilbert (August 21-25, 1963).

in salinity and temperature distributions within the eddy were the primary objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. The vessel operated in the area bounded by  $19^{\circ}30' - 20^{\circ}30'$  N. latitude and  $156^{\circ}30' - 158^{\circ}$  W. longitude. Cruise tracks during phase I (August 21-25, 1963) and phase

II (August 26-29, 1963) are shown in figures 1-2.

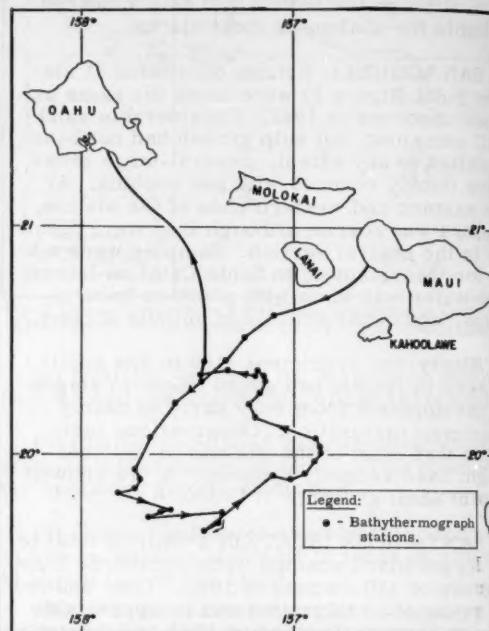


Fig. 2 - Cruise 68 track, Phase II, M/V Charles H. Gilbert (August 26-29, 1963).

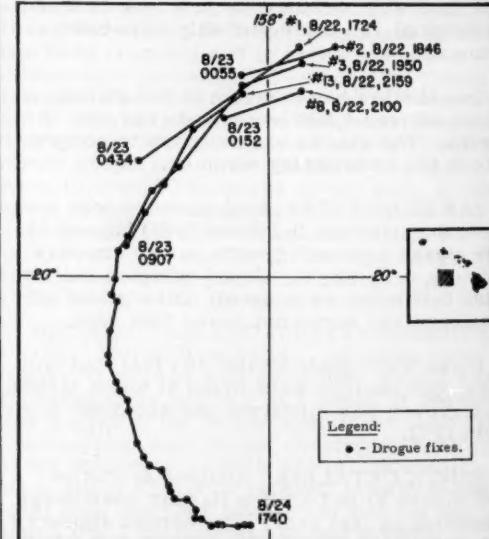


Fig. 3 - Drift of parachute drogues set at depth of 40 feet, August 22-24, 1963. M/V Charles H. Gilbert Cruise 68, Phase I.

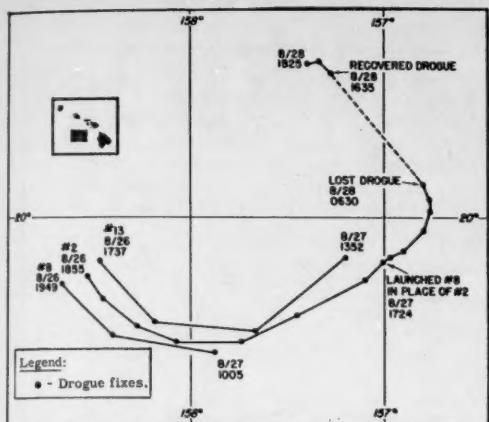


Fig. 4 - Drift of parachute drogues set at depth of 40 feet, August 26-28, 1963. M/V Charles H. Gilbert Cruise 68, Phase II.

During phase I of the cruise a major eddy was located southeast of Oahu. A thermal dome associated with the eddy was located in the vicinity of 20°25' N. latitude and 157°26' W. longitude. Parachute drogues were launched about 25 miles from the thermal dome and tracked for 3 days. During phase II of the cruise, tracking of the eddy was resumed. The drogues were tracked in a cyclonic movement to within 10 miles of the starting point. The average speed of the drogues was 1.5 knots. Phase I and phase II drogue drifts are shown in figures 3 and 4.

Other activities during the cruise were:

Approximately 60 drift cards and 80 drift bottles were released during both phases of the cruise.

Watches were kept for fish schools and bird flocks, although no pronounced association was found between such sightings and the eddy system.

A thermograph and barograph were operated continuously during the cruise.

Two lures were trolled during daylight hours. The total catch during the cruise consisted of nine Mahimahi (Coryphaena hippurus).

Bathythermograph observations were made at intervals of one hour except while following drogues, when observations were made at each drogue fix.

During phase I of the cruise, shipboard and scientific activities were photographed for a television program.

Note: See Commercial Fisheries Review, August 1963 p. 21.

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#### VISUAL PERCEPTION OF SKIPJACK TUNA AND LITTLE TUNNY:

Experiments to test the visual acuity of tuna have produced comparative data for two of the species that are being maintained in the experimental facilities of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii. It appears that skipjack tuna (Katsuwonus pelamis) have more acute vision at high light intensities than the closely related little tunny (Euthynnus yaito). In dimmer light, the two species are about equal in visual perception.

The tuna used in the experiments were kept in rapidly circulating sea water in a long rectangular tank, which was roofed and enclosed to control the available light. The biologist conducting the experiments was concealed in an observation booth, so that his presence and his actions would not influence the behavior of the tuna. In one end of the tank was an underwater window with a frosted glass screen on which various patterns could be focused from a slide projector. In preparation for the vision tests, tuna were trained by rewarding them with food when they approached a projected pattern of vertical stripes, and punishing them with an electric shock if they approached when a pattern of horizontal stripes was shown.

In the testing procedure, the projector was turned on when a tuna was at the end of the tank opposite the window. The fish immediately reacted by swimming rapidly toward the light. When the fish reached a marked distance from the window, the projector was turned off. If the fish had seen vertical stripes on the screen, it would continue down the tank to receive its reward. If the fish turned around and returned to the far end of the tank, it indicated that the tuna had detected a pattern of horizontal stripes. The tuna were scored for correct and incorrect reactions to the projected patterns.

The visual acuity of the tuna under different light conditions was measured by varying the distance between the fish and the window when the projector was turned off, the width of the projected stripes, and the intensity of

the projection light. From such data it was possible to estimate how large an object a tuna can distinguish at a given level of illumination.

It was found, for example, that skipjack have keen enough vision to distinguish a dark object about 1 inch square to a distance of around 50 feet under optimum light conditions in their normal habitat, that is, within the upper 150 feet of clear oceanic water around noon on a sunny day. Under the same conditions, the little tunny apparently could not make out the same object at a distance of more than 33 feet.

Additional experiments should make possible more detailed comparisons of the visual acuity of tuna species. The studies should have definite practical implications for the design of fishing gear and the planning of fishing strategy.



### Clams

#### SURF CLAM RESOURCES OFF NEW JERSEY COAST SURVEYED:

A survey of the Atlantic east coast surf or sea clam potential was initiated this past summer with the signing of a cooperative agreement between the U. S. Bureau of Commercial Fisheries and the Sea Clam Packers Committee of the Oyster Institute of North America. The agreement provides for the Bureau to direct the technical activities related to the offshore clam survey, prepare progress reports for public release, and contribute some clam sampling equipment. The Sea Clam Packers Committee, representing the surf-clam industry, is providing a vessel with captain and crew, and will operate the vessel.

Scheduled to last at least 10 weeks, the survey will concentrate on determining the availability of surf clam just beyond the operating area of the current commercial fishery. It will extend generally from Cape May, N. J., to Long Island, N. Y., and to 40 miles offshore.



### Federal Purchases of Fishery Products

#### DEPARTMENT OF DEFENSE PURCHASES:

January-March 1963: Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased in March 1963 by the Defense Subsistence Supply Centers than in the previous month. The increase was 5.1 percent in quantity and 10.3 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, March 1963 with Comparisons

QUANTITY				VALUE			
March	Jan.-Mar.	March	Jan.-Mar.	March	Jan.-Mar.	March	Jan.-Mar.
1963	1962	1963	1962	1963	1962	1963	1962
2,064	1,948	6,117	4,788	1,178	1,084	3,792	2,874

Compared with the same month a year earlier, purchases in March 1963 were up 6.0 percent in quantity and 8.7 percent in value. Purchases this March included 494,000 pounds of shrimp as well as substantial quantities of ocean perch fillets, flounder fillets, haddock fillets, halibut, scallops, and oysters. Prices paid for fresh and frozen fishery products by the Department of Defense in March 1963 averaged 57.1 cents a pound, 2.7 cents a pound more than in the previous month, and 1.5 cents a pound more than in the same month of 1962.

During the first 3 months of 1963, purchases were up 27.8 percent in quantity and 31.9 percent in value from those in the same period of the previous year.

Canned: Canned tuna was the principal canned fishery product purchased for use of the Armed Forces in March 1963. Purchases of the three principal canned fishery products (tuna, salmon, and sardines) in the first quarter of 1963 were down 79.6 percent in quantity and 82.2 percent in value from those in the same period of 1962. The decline was due to lower purchases of canned tuna and salmon.

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, March 1963 with Comparisons

Product	QUANTITY				VALUE			
	March	Jan.-Mar.	March	Jan.-Mar.	March	Jan.-Mar.	March	Jan.-Mar.
Tuna	686	-	696	3,113	352	-	358	1,739
Salmon	-	1,015	6	1,015	-	638	4	638
Sardine	49	3	143	10	22	2	61	6

\* \* \* \* \*

January-June 1963: Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers during the second quarter of 1963 than in the same period of 1962. The decline was 21.9 percent in quantity and 23.3 percent in value. Purchases during April-June 1963 included 1,517,000 pounds of shrimp, 786,000 pounds of scallops, 407,000 pounds of oysters, 941,000 pounds of ocean perch fillets, 674,000 pounds of flounder fillets, 534,000 pounds of haddock fillets, and 323,000 pounds of halibut, as well as substantial quantities of cod fillets and sole fillets. A number of other items were purchased in smaller volume. Prices paid for fresh and frozen fishery products by the Department of Defense during the second quarter of 1963 averaged 53.1 cents per pound.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April-June 1963 with Comparisons

QUANTITY		VALUE	
April-June	Jan.-June	April-June	Jan.-June
1963	1962	1963	1962
5,611	7,185	11,878	11,973
(\$1,000 Lbs.)		(\$1,000)	
2,981	3,888	6,773	6,762

Total purchases in the first 6 months of 1963 were almost identical in both quantity and value to those in the same period of the previous year.

Canned: Canned tuna and canned sardines were purchased in quantity for the use of the

Table 2 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, April-June 1963 with Comparisons

Product	QUANTITY		VALUE	
	April-June	Jan.-June	April-June	Jan.-June
	1963	1962	1963	1962
Tuna	1,194	594	1,890	3,707
Salmon	8	-	16	1,015
Sardine	154	40	297	50
	(\$1,000 Lbs.)		(\$1,000)	
	568	568	323	926
	6	-	10	638
	61	19	122	25

Armed Forces during April-June 1963, but purchases of canned salmon continued very light. Purchases of the three principal canned fishery products (tuna, salmon, and sardines) in the first 6 months of 1963 were down 53.8 percent in quantity and 61.2 percent in value from those in the same period of 1962.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

(2) See Commercial Fisheries Review, Sept. 1963 p. 24.



## Fish Meal

### RECENT DEVELOPMENTS IN USE OF FISH MEAL IN POULTRY AND HOG RATIONS:

During the latter part of July and much of August 1963, an animal nutritionist in the Technical Advisory Unit of the U.S. Bureau of Commercial Fisheries, traveled on the west coast, stopping en route to attend a poultry convention at Chicago, and attending one scientific meeting at Corvallis, Oreg., and another at Stillwater, Okla. During the trip, scientists at a number of experiment stations were visited and calls were made on representatives of mixed feed corporations and producers of industrial fish products. Some observations made on the trip are reported.

Fish meal is used more liberally on the west coast than it is in most other parts of the country. A factor contributing to this situation is the relative price structure of grain and oil seed products compared with the price of fish meal on the west coast. Shipping charges add to the cost of such products as soybean meal and corn shipped from the Great Plains area, whereas much of the fish meal used in the west is produced on the coast or imported from Peru and, of course, is less expensive there than it is inland. Western rations for growing chicks ordinarily contain up to 5 percent (and often much more) fish meal and laying rations up to 3 percent of the meal. (With the exception of the west coast and the Delaware, Maryland, and Virginia areas, levels of 3 percent fish meal for growing chicks and 0.5 percent for layers ordinarily are considered high.) "Least cost" calculations made in mid-1963 by two different firms indicated that 11 and 15 percent fish meal could be incorporated economically in chick rations.

Mixed feed production on the west coast differs from practice at most other places in that feeds are largely custom-mixed in the former region; such rations tend to be more liberally supplied with fish meal than those based upon proprietary formulas. Only a few western firms attempt to market the bulk of their output as "brand name" feeds, mixed on a proprietary-formula basis, according to various western authorities.

Workers at several western experiment stations are engaged in research on the utilization of industrial fish products. For example, at the University of California, studies both on fish oils and on certain digestive en-

zymes of fish that act on lipids are in progress; findings on tuna are presently in press and those on menhaden in process of preparation. At this same station, work is also being carried out on antioxidants for use with marine oils. At Oregon State University, a long-term project is being carried out on the uses of fish oil in animal feeding and on the uses of antioxidants to preserve fish oil. Workers there have observed that swine attain excellent growth rates when their rations contain 2.5 and 5 percent menhaden oil.

Poultry producers, constituting the bulk outlet for industrial fish products, can be expected to remain a good market for fish products as long as they can do business at a profit. However, economists have long maintained that United States poultry production operates dangerously close to the margin and any trend toward relief of this situation should be welcome. Such a trend was generally acknowledged at the Annual Poultry Congress and Exposition held at Chicago, July 24-26, where an aura of excitement concerning recent improvements in efficiency and the expectations of further advances pervaded the meetings. Efficiency, expressed in terms of the number of hens a worker can care for, has undergone something like a tenfold increase during the past half century, and further increases are already in sight. Much of the past improvement has come through mechanization, but in addition, such things as environmental control (control of temperature, light, and dust, and exclusion of wild animals and birds, etc.) and improved management are expected to contribute to increased efficiency in the near future.

Some of the papers given at the meetings of the American Society of Animal Science at Corvallis, Oreg., August 12-15, dealt directly with the values of fish meal in rations for swine. Brief summaries of those papers follow:

Researchers from State College, Fresno, Calif., reported that 1.5 percent fish meal added to a barley-grain, sorghum-degossypolized cottonseed ration containing no animal protein tended to improve rate of gain and enhance the efficiency of feed conversion by pigs. The addition of 0.1 percent lysine to the ration also tended to improve rate of gain but failed to enhance feed efficiency. Neither the addition of 0.5 percent lysine nor of 0.15 percent methionine hydroxy analog influenced rate of gain or feed efficiency.

Scientists from the University of Idaho evaluated the addition of herring fish meal, methionine, and B vitamins to barley-pea rations for growing-finishing swine. The addition of fish meal to the rations resulted in increased rate of gain in each of 4 trials and in improved efficiency of feed utilization in 3 of 4 trials. In each of two trials, methionine likewise increased feed efficiency and, to a lesser degree than did fish meal, it increased rate of gain. B vitamins resulted in slightly improved rates of gain but failed to influence feed efficiency to any great extent.

A scientist from the University of Illinois reported that fish meal added to a grain sorghum-peanut meal mixture resulted in significant improvement in the performance of pigs from 18 to 47 days of age. The fish meal was added to the mixture in amounts equivalent to 4, 6, 8, and 10 percent of the ration; all except the lowest of these additions were similarly effective. In a second experiment, gains were significantly and equally improved by the addition to a grain sorghum-peanut meal mixture of the following: 0.13 percent lysine; 0.13 percent lysine plus 0.13 percent DL-methionine, 3 percent menhaden meal; and 3 percent menhaden meal plus 0.1 percent DL-methionine. However, in each case the gains were less than those made on a corn-soybean meal ration with a nitrogen content equal to that of the ration with which it was compared.

Some of the experiments, reported upon, dealt directly with the amino acid requirements rather than with the relative merits of the various protein concentrates. The reason for this specialization is that it has become increasingly evident that a mutual balance among the essential amino acids must be attained before optimum nutritional performance can be achieved. After the relative requirements of the amino acids have been established, it doubtless will become possible, by means of optimal amino acid balances in rations, to increase the economy of feed utilization by swine to levels above those now commonly attained. Thus, the papers on amino acid requirements of swine are of primary value in establishing the true values of fish meal as a protein concentrate. Some brief summaries of amino acid requirements follow:

Representatives of a commercial feed company, reported a somewhat greater rate of gain and improved feed efficiency as com-

pared with performance on the basal ration when 0.1 percent lysine was added to an 11-percent protein, corn-soybean meal ration for pigs. In similar trials with rations containing 13 percent protein, lysine failed to influence rate of gain but did improve feed efficiency.

North Carolina State College scientists reported that the addition of 0.3 percent L-lysine, 0.05 percent DL-tryptophan, and 0.2 percent isoleucine to an 8-percent protein, corn-soybean meal ration significantly increased feed intake, rate of gain, and feed efficiency of pigs. Lysine and tryptophan, added together, also improved the ration but lysine and isoleucine without tryptophan depressed performance.

At the Annual Meeting of the Poultry Science Association, Stillwater, Okla., August 19-23, 1963, a few of the papers dealt directly with the values of fish meal in poultry rations, but far more of them dealt with the amino acid requirements of poultry. Such papers are, of course, of primary importance in establishing the true value of fish meal as a protein source in poultry rations. A review of selected papers follows:

The Ohio Agricultural Experiment Station reported that the addition of 2.5 percent fish meal plus 0.2 percent fish solubles to a corn-soybean meal breeder ration slightly improved egg production of turkey hens and tended to increase growth rate of pouls. Poult growth was slightly accelerated, but egg production of hens was not increased by the addition of 5 percent alfalfa meal.

Interactions between nutrition, environment, and performance were also demonstrated at the Ohio station. Maximum growth and egg production rates were obtained with range-reared birds that received UGF (unidentified growth factors) and were kept on litter floors during the reproductive season; poorest results were obtained with birds reared in confinement on raised wooden-slat floors, fed rations unsupplemented with UGF and kept in slat floor pens or wire cages during the laying season.

Annual nutritionists from Utah State University reported that a ration containing 18 percent protein supplied by peanut meal was found deficient in the sulfur-containing amino acids, and in lysine and threonine; the amino acids became limiting in the order given. A

ration containing 22.5 percent protein supplied by peanut meal plus corn was found deficient in lysine and methionine and slightly deficient in valine and threonine as well. The University workers pointed out that fish meal, which is well supplied with the amino acids not present in sufficient amounts in peanut meal, can supply the needed amino acids.

Other scientists from Michigan State University reported that when two rations each containing 16 percent protein but having different energy values, were fed to 5-week-old chicks, growth was significantly more rapid on the ration having the greater caloric value. Although the amino acid contents of the two rations were similar, chicks on the lower energy ration responded to methionine supplementation while those on the higher energy ration failed to do so.

Chicks on a control ration containing 21 percent protein utilized feed more efficiently than did those given less protein. The authors pointed out that "... the response obtained from amino acid supplementation depends not only on the protein but also on the adequacy of energy."



## Florida

### FEEDING BEHAVIOR STUDY OF CORAL REEF FISH:

The National Science Foundation has issued a grant of \$47,200 to the Institute of Marine Science, University of Miami, for a study of the feeding behavior of coral reef fish. The research program will be directed by the Curator of Fish for the Institute. Graduate students will assist in the field work, which will involve day and night diving to observe and collect fish in the Florida Keys.

Studies of coral reef fish have been in progress at the University of Miami for the past seven years and a great deal of scientific information has been accumulated on many of the 600 species found on Florida reefs. In 1962, a night-diving program was begun at Alligator Reef, near Islamorada. Night diving is important to an ecological study because certain nocturnal fish can be observed better at night, or in some cases only at night. Scientists are also interested in nighttime variations in feeding habits. The

new research program will involve at least three years of work.

The food habits of the grunts are particularly important to the study, as they make up a large portion of the fish population on Florida reefs. Certain morays, wrasses, surgeonfish, butterflyfish, gobies, blennies, and others will also be included in the study. It is hoped that the study will reveal when peaks of feeding activity occur on the reefs, how feeding habits change with the season, and how the anatomy of the feeding mechanisms has been modified to permit feeding on specific organisms and in special habitats.



## Great Lakes Fisheries

### Exploration and Gear Research

#### TRAWLING INVESTIGATIONS IN LAKE MICHIGAN CONTINUED:

**M/V "Kaho" Cruise 13 (Phase I--August 14-28, 1963; Phase II--September 6-18, 1963):** Trawl fishing explorations were continued throughout Lake Michigan and Green Bay dur-

ing this 27-day cruise (divided into 2 phases) by the U. S. Bureau of Commercial Fisheries research vessel *Kaho*. The primary objectives of the cruise were to: (1) investigate the seasonal distribution and abundance of various fish stocks, (2) determine the seasonal effectiveness of commercial-type otter trawls for catching abundant species such as alewife and chubs, and (3) further define areas suitable for otter-trawl fishing.

Fair to good fishing was experienced in all areas visited except the Beaver Island-Charlevoix area where rough bottom conditions hampered fishing operations. Alewife dominated catches in Green Bay and, with few exceptions, those in Lake Michigan at depths from 5 to 20 fathoms. Potentially good commercial catches of "bloater" chubs were taken throughout most of the lake in the 15- to 45-fathom depth range, with the central and southern areas generally more productive. One shallow drag off Saugatuck produced a good catch of yellow perch of marketable size.

**FISHING OPERATIONS:** A total of 109 trawl drags were completed with a 52-foot (headrope) Gulf-of-Mexico-type fish trawl. Efforts were made to keep each drag at a uniform depth. All drags were of 30-minute duration except for 12 tows which were terminated when the net became fouled on bottom obstructions or when irregular bottom conditions or set nets were encountered. Minor gear damage occurred during 10 drags and a major loss of net webbing resulted from 2 drags. Bottom topography and bathymetric distribution of fish were continuously recorded with a high-resolution white-line-type depth-sounder recorder.

Suitable conditions for trawling were found to be scarce in the rugged bottom areas of northern Lake Michigan between Green Bay and Manistique; throughout most of the island area; and along the eastern shore as far south as Frankfort.

In addition to the 13 drags made in Green Bay and the 21 drags in northern Lake Michigan, 75 drags were made along 3 lakewide transects between various lake ports within southern Lake Michigan to study the extent of deepwater fish stocks as well as differentials in east-west and north-south fish distribution.

**FISHING RESULTS:** Green Bay: Commercially significant catches of alewife and/or



smelt were taken at several localities in Green Bay. The best catches of alewife were obtained at  $10\frac{1}{2}$  fathoms off Menominee and at 3 stations south of Big Bay de Noc at depths of  $6\frac{1}{2}$  and 11 fathoms. Eleven stations yielded catches of smelt; however, only 1 drag completed west of Chambers Island resulted in a catch of commercial proportion (300 pounds--30 percent 6-10 count per pound; 70 percent 20-30 count per pound). Whitefish appeared in 5 catches in amounts of 4 pounds or less. Yellow perch were present in only 2 drags and in both cases the catch was less than 1 pound.

**Northern Lake Michigan:** Clear bottom areas at depths between 15 and 40 fathoms off Manistique and between 20 and 40 fathoms off Arcadia yielded 7 relatively good catches of chubs ranging from 235 to 472 pounds. Two catches made off Manistique at 20 and 25 fathoms and 1 catch off Arcadia at 20 fathoms contained exceptional proportions of large chubs (18.4, 40.7, and 16.5 percent, respectively). Trawlable grounds located north and east of Beaver Island and near Charlevoix in Little Traverse Bay yielded negligible catches of small chubs and alewife. Other commercial species which appeared in trawl catches in less than significant amounts included whitefish (10 pounds total from 2 drags) and smelt (220 pounds total from 11 drags).

**Southern Lake Michigan:** The investigations completed along the three lakewide transect lines, between Ludington and Manitowoc, Saugatuck and Racine, and St. Joseph and Waukegan, revealed significant differences in depth distribution, abundance, and species interrelationship from one side of the lake to the other, as well as from one transect area to the others. With 2 exceptions, alewife (taken in amounts up to 820, 300, and 768 pounds per drag on each transect, respectively) dominated all catches within the 5- to 20-fathom depth range. The exceptions occurred off Racine, where "bloater" chubs made up 59.8 percent of the catch at 20 fathoms and 63.3 percent at 15 fathoms, and off Saugatuck at 5 fathoms, where 420 pounds of yellow perch were taken.

The most consistent chub catches were obtained along the Ludington-Manitowoc transect (19 drags averaged 190 pounds) and were best along the Michigan shore at 20 to 50 fathoms. Along other transects, the average catch rate was lower, (23 drags averaged 182 pounds--Saugatuck to Racine, and 20 drags averaged

140 pounds--St. Joseph to Waukegan) and catches tended to be better on the western side of the lake.

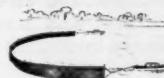
Yellow perch were taken in 10 drags in amounts of 85 pounds or less. Whitefish catches, ranging from 1 to 6 pounds, were taken in 5 drags. Smelt were produced in 18 drags in amounts of 10 pounds or less.

**Miscellaneous Species:** Other species appeared in trawl catches during the cruise as follows (frequency of catch and rate of catch shown in parenthesis):

Burbot (2 drags-- $\frac{1}{2}$  to 4 pounds), carp (4 drags-- $\frac{1}{2}$  to 90 pounds), herring (9 drags--1 to 9 pounds), minnows (5 drags--up to 15 pounds), round whitefish (1 drag-- $\frac{1}{2}$  pound), sculpins (54 drags--up to 70 pounds), sea lamprey (4 drags--1 individual per drag), suckers (3 drags--2 to 40 pounds), stickleback (6 drags--up to 1 pound), and trout-perch (5 drags--up to 10 pounds).

**HYDROGRAPHIC DATA:** A total of 64 bathythermograph casts were made and air and surface temperatures were continuously recorded as a supplement to trawl fishing data. Surface water temperatures ranged from  $40.0^{\circ}$  F. near Ludington, Mich. (recorded during a wind induced upwelling), to  $65.0^{\circ}$  F. in Green Bay and other localities in Lake Michigan proper. A narrow thermocline with a temperature variation of about  $11^{\circ}$  F. was noted in southern reaches of the lake. This temperature gradient apparently influenced the distribution of alewife.

**Note:** See *Commercial Fisheries Review*, August 1963 p. 23; Sept. 1963 p. 26.



## Great Lakes Fishery Investigations

### LAKE TROUT DISTRIBUTION STUDIES CONTINUED:

**M/V "Siscowet" Cruise 6** (August 19-27, 1963): To establish a catch-per-unit-effort index for lake trout in Keweenaw Bay, Grand Traverse Bay, and Shelter Bay, Mich., which can be used to measure the relative abundance of native and hatchery-reared fish in future years, was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel *Siscowet*. Ten to twelve trawl tows were made at each location. The average number of juvenile lake trout caught per

15-minute trawl tow was 13.5 in Keweenaw Bay (north of Pequaming), 1.1 in Grand Traverse Bay, and 1.3 in Shelter Bay (east of Laughing Fish Point).

All of the 194 lake trout captured (range in length: 4.6 to 13.4 inches) were fin clipped. The fish were most abundant in 27-33 fathoms. The lake trout planted at Pequaming in the spring of 1963 were most common in the catches from Keweenaw Bay and were noticeably more abundant nearest the planting site. Trout planted at Bete Grise in the spring of 1962 predominated in the catches at Grand Traverse Bay, and most of those taken in Shelter Bay were planted in that area in 1962. Other species taken during trawling were smelt, chubs, sticklebacks, sculpins, and pygmy whitefish.

Small-mesh gill nets (600 feet of  $2\frac{1}{4}$ -inch and 300 feet of  $2\frac{1}{2}$ -inch mesh), set at 66 fathoms in Keweenaw Bay to obtain blood samples from chubs for electropheretic studies, yielded 129 chubs (*Coregonus hoyi*, *C. kiyi*, and *C. zenithicus*), 3 lake herring, and 1 fin-clipped lake trout. The same gang of nets set at 16 fathoms in Grand Traverse Bay caught only 5 lake herring, 6 lake trout (all fin clipped), and 1 longnose sucker.

Field data were collected for a detailed contour map of Au Train and Shelter Bays to facilitate future trawling. Young-of-the-year lake trout were abundant in that area in 1952-1953.

Experimental gill nets (15 nets ranging in mesh size from 1 to  $5\frac{1}{2}$  inches) were fished at 12-26 fathoms at Stannard Rock, about 45 miles north of Marquette, Mich. The catch included 42 native lake trout (7-31 inches long), 85 lake herring, 79 burbot, and 93 chubs (*C. kiyi*). The catch of *C. kiyi* was unusual, since the species is relatively uncommon at depths less than 60 fathoms.

Surface water temperatures ranged from  $53.2^{\circ}$  F. at Stannard Rock to  $62.4^{\circ}$  F. in Keweenaw Bay.

Note: See Commercial Fisheries Review, October 1963 p. 22.



## Gulf Exploratory Fishery Program

### SURVEY OF SEASONAL DISTRIBUTION OF ROYAL-RED SHRIMP:

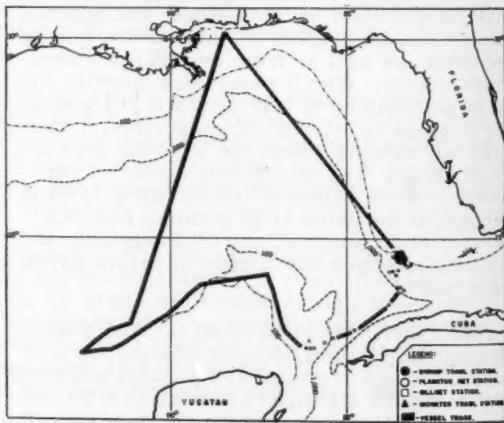
M/V "Oregon" Cruise 86 (July 23-August 15, 1963): To continue seasonal coverage of royal-red shrimp (*Hymenopenaeus robustus*) re-

sources on the Dry Tortugas grounds, to conduct deep-water faunal transects in the north and southeast Gulf of Mexico, and to begin preliminary gear trials with experimental monofilament gill nets were the main objectives of this 23-day exploratory cruise in the Florida Straits-Campeche Bank area by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

Thirty-two 3-hour drags on the Tortugas grounds in the 190- to 225-fathom depth range with conventionally-rigged 40- and 65-foot flat trawls towed from a single warp and 25 fathom bridle produced 2,525 pounds of royal-red shrimp tails (predominately 31-35 count). The area fished was centered between  $83^{\circ} 38'$  and  $83^{\circ} 05'$  west longitude. The best catches occurred in 210 fathoms between  $83^{\circ} 36'$  and  $83^{\circ} 25'$  west longitude. Bottom temperatures varied from  $47^{\circ}$  to  $49^{\circ}$  F.

Fishing operations were hampered somewhat by strong currents and rough seas. Vessel speed and warp length were adjusted according to towing direction, but several drags were considered to be marginal. Some 300 feet of film were exposed with the trawl-mounted movie camera in the red shrimp depth range, but mechanical breakdowns curtailed further work with the system.

A series of 40-minute shrimp-trawl drags was made at 100-fathom intervals off the Dry Tortugas grounds, beginning at the 100-fathom contour. Catches were generally small out to 500 fathoms and fell off rapidly there-



after. Drags were discontinued beyond 800 fathoms because of bad bottom conditions. The general character of the bottom and the comparatively light catches indicate an active scour condition in the transect area, especially at the deeper stations. The condition is probably caused by the proximity of the Gulf Stream Axis.

A "blind" 4-hour night set with a 7-inch mesh nylon gill net (900 x 60 feet) off the Tugas area produced some 3,000 pounds of sharks, predominately white tip (*Carcharhinus longimanus*).

Three days of scouting around the periphery of Campeche Bank failed to yield sufficient quantities of surface-schooling fish to warrant testing the monofilament gill net.

Plankton tows were made incidental to operations at trawling stations and separately in cooperation with the Florida State Board of Conservation.

Additional work off the Mississippi Delta was cancelled because of the vessel's early return to port.



## Hawaii

### SKIPJACK TUNA LANDINGS, JANUARY-AUGUST 1963:

Skipjack tuna landings in Hawaii in August 1963 were about 2.4 million pounds, 800,000 pounds above the 1948-62 average for the month. The cumulative total catch for January-August 1963 was 6.7 million pounds, almost 1.0 million pounds below the 1948-62 average for the same period.

During August there were 153 productive trips, giving an average of 14,268 pounds per productive trip. Individual catches ranged from 217 pounds to 43,390 pounds.

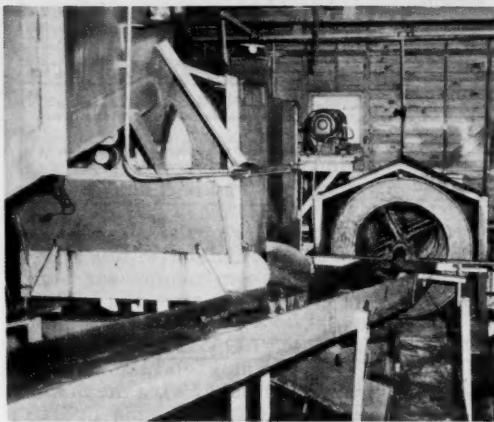


### Industrial Fishery Products

#### U.S. FISH MEAL, OIL, AND SOLUBLES:

Major Indicators for U.S. Supply, August 1963: United States production of fish meal and fish solubles in August 1963 was higher by 11.2 and 17.6 percent, respectively, as com-

pared with August 1962. Fish oil production was down 3.1 percent.



Menhaden from the fish pumps are separated from the pump water in the rotary sieve of an industrial fishery products plant in Moss Point, Miss.

Item and Period	Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, August 1963				
	1963	1962	1961	1960	1959
<b>Fish Meal:</b>					
<u>Production 1/:</u>					
October	-	36,614	16,852	24,455	22,026
September	-	31,165	28,642	36,239	36,874
August	43,336	38,955	57,031	49,709	47,364
January-July	128,293	166,949	171,726	146,635	143,605
Jan.-Dec. prelim. totals 2/	-	288,336	289,039	257,969	275,396
Jan.-Dec. final tot.	-	310,000	311,265	290,137	306,551
<u>Imports:</u>					
October	-	12,732	8,425	12,515	3,821
September	-	13,698	13,941	9,487	9,224
August	-	28,253	19,026	8,340	5,695
January-July	225,157	166,743	126,173	79,506	105,724
Jan.-Dec. totals	-	252,307	217,845	131,561	133,955
<b>Fish Solubles:</b>					
<u>Production 3/:</u>					
October	-	15,010	8,415	11,139	13,946
September	-	12,008	11,415	12,367	25,651
August	18,626	15,833	19,603	16,891	30,378
January-July	56,505	71,401	58,823	59,499	96,448
Jan.-Dec. prelim. totals	-	120,866	109,018	106,361	176,913
Jan.-Dec. final tot.	-	124,334	112,241	98,929	165,359
<u>Imports:</u>					
October	-	290	110	-	1,908
September	-	178	263	38	1,732
August	-	422	318	180	4,718
January-July	2,769	4,596	1,927	2,614	14,763
Jan.-Dec. totals	-	6,308	6,739	3,174	26,630
<b>Fish Oils:</b>					
<u>Production:</u>					
October	-	39,563	14,734	23,439	16,866
September	-	30,723	24,986	30,530	22,383
August	32,500	33,526	50,749	38,052	30,043
January-July	99,688	139,472	145,831	94,463	94,185
Jan.-Dec. prelim. totals 4/	-	257,131	259,400	206,848	189,240
Jan.-Dec. final tot.	-	255,808	266,570	215,861	193,324

(Table continued on next page)

Item and Period	1963	1962	1961	1960	1959
	.....	(1,000 Pounds)	.....	.....	.....
<b>Exports:</b>					
October . . . . .	-	26,003	15,202	4,434	14,331
September . . . . .	-	219	9,521	13,959	8,469
August . . . . .	-	33,272	13,304	1,395	18,367
January-July . . . . .	127,147	63,133	72,549	93,441	77,634
Jan.-Dec. totals . . . . .	123,050	122,486	143,659	144,481	

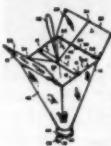
Does not include crab meat, shrimp, and misc. meats.  
/Preliminary data computed from monthly data. Fish meal production reported currently comprised 90 percent for 1959, 89 percent for 1960, 93 percent for 1961 and 1962.  
/Includes homogenized fish.  
/Preliminary data computed from monthly data. Represents over 95 percent of the total production.  
/Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.  
Note: Data for 1963 are preliminary.



## Inventions

### CATCH-ALL FISH NET PATENTED:

The inventor claims an improved fish net of wire mesh which can be used for catching or retaining live fish or bait. Two hinged doors are provided with cord control to trap bait or fish upon withdrawal from water. A slide bolt locks a smaller door at the lower end of the net. (Patent No. 3,045,383, SIC No. 2298, granted Philip Pugliese, 330, South Regent St., Port Chester, N. Y.)



\* \* \* \* \*

### FISH HOOK SNELLING DEVICE PATENTED:

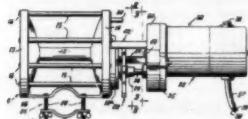
The inventor claims a simple and inexpensive device made from sheet metal which can be used for quickly and easily snelling hooks of any size to any weight of leader. (Patent No. 2,700,840, SIC No. 3949, granted John N. Butts, 7029 190th St., S.W., Lynwood, Wash.)



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### FISHING REEL WITH ELECTRIC MOTOR DRIVE ATTACHMENT:

Designed for salt water reels used by sport and commercial fishermen. A 12-, 18-, or 24-volt battery on a fishing craft provides power for the gear head motor. (Patent No. 3,077,318, SIC No. 3949, granted Morris S. DuVal, 4102 Maple Avenue, Dallas 19, Tex.)



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### FISHING ROD HOLDER PATENTED:

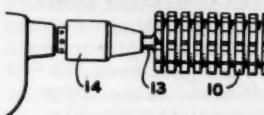
Designed for ice fishing. The inventor claims the holder works like a windmill on a fulcrum, tipping up when fish bite and automatically going back into position if the fish is not caught. (Patent No. 3,074,197, SIC No. 3949, granted John A. Schnars, 4707 Beneteau St., Detroit 14, Mich.)



\* \* \* \* \*

### FISH SCALER PATENTED:

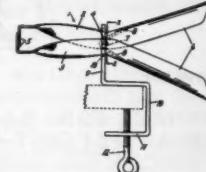
The inventor claims an economical device which quickly and efficiently removes scales. It is made of molded plastic with a shaft extending therefrom which is readily secured to a portable electric drill. (Patent No. 3,072,956, SIC No. 3079, granted Walter Orlrich, 4219 W. 59th St., Cleveland 9, Ohio.)



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### HOLDER FOR SCALING FISH PATENTED:

The inventor claims a device which can be easily clamped to any table or flat working surface. It can be rotated to flip the fish from one side to the other. (Patent No. 2,980,948, SIC No. 3429, granted Homer Ivy McCain, 423 Fifth St., Traverse City, Mich.)



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### METHOD FOR SHUCKING SCALLOPS PATENTED:

The inventor claims the method offers a sanitary and economical means of shucking small bay scallops. It involves subjecting the closed scallop shell to a high frequency electrical field which causes the muscles and viscera to separate from the shell, and the shell to partially open, thereby making available the edible portion of the scallop in its natural raw state. (Patent No. 3,070,834, SIC No. 3662, granted J. Hall Carpenter, P.O. Box 3272, Jacksonville 6, Fla.)



## Maine Sardines

### EXPORT MARKET DEVELOPMENT PROGRAM LAUNCHED:

The Maine Sardine Council has launched an export market development program on a world-wide basis. Legislature, during the recent session, authorized that activity which will be financed by regular sardine tax funds paid to the State by the canners.

The plan is to create expanded long-term outlets for the industry.

Maine sardines will be procured for the Council by the State Purchasing Agent on a competitive bid basis and then sold by the former in foreign countries. Arrangements had been made with an international export firm in New York to assist the Council with the selling and distribution.

"Although we expect to find the situation highly competitive in most areas we plan to make every effort to get a sizable slice of the world sardine traffic," the Council's Executive Secretary stated.

Recent data released by the Food and Agriculture Organization of the United Nations revealed that approximately 16 million cases of sardines, valued at \$100 million, were handled in international trade in 1962. Maine, which is one of the world's largest sardine producers, contributed but an infinitesimal share of this volume.

With more and more emphasis being placed on foreign trade the Maine sardine industry has decided that the time has arrived to try to do something to participate.



## North Atlantic Fisheries Exploration and Gear Research

### ELECTRONIC TRAWL-NET MEASURING AND INSTRUMENTATION STUDIES CONTINUED:

M/V "Delaware" Cruise 63-7 (August 19-30, 1963): The main objectives of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware were: (1) to continue "sonic" trawl-door and net measurements begun during Delaware Cruises 63-2 and 63-3; (2) to evaluate the performance

of a modified transducer suspension system for trawl doors; (3) to develop an improved recording technique different from that used during the previous two instrumentation cruises of the Delaware; and (4) to determine the tidal influence upon the trawl performance by correlating known tide direction relative to the vessel towing course.

Simultaneous, graphic measurements of trawl door spread, wing opening, vertical opening, and fishing depth were made and automatically recorded on an echo-sounder roll-chart aboard the Delaware. Improvements and refinements have been made on the sonic-transducer measuring system which allowed accurate measurements of all parameters to be recorded on the echo sounder's moving strip chart in the vessel's pilothouse (see figure).



A part of an echograph recording of the linear dimensions measured during Cruise 63-7. The length of the trawl warp used during the recording was 100 fathoms; the depth of the water was 27 fathoms; and the vessel towing speed was approximately 2.92 knots (190 engine r. p. m.). The "letters" on the recording and the identity of the lines indicated are: A--zero line or starting pulse; B--height of headrope above the bottom; C--distance between the wing ends of the net; and E--depth of the water below the vessel's keel. All spread dimensions are measured from the zero line (A) to each individual echo; the measurements are read A-B, A-C, A-D, and A-E. The spread dimensions as shown are: B = 8 feet, C = 45 feet, D = 108 feet, and E = 27 fathoms. (Reproduction reduced in size.)

The work area selected for the cruise was located 15 miles south of "No Mans Land Buoy" (buoy located approximately 24 miles south of New Bedford, Mass.). The depth of water in the work area was 26 fathoms. All measurement tows were conducted within a plot of good trawable bottom, 2 miles square,

identified by marker buoys placed at each corner of the plot.

Considerable difficulty was experienced while trying to determine the correct placement of the trawl-door transducers for optimum recording results. Several angular placements on the trawl doors were tried before satisfactory results were obtained. This led to the following tentative conclusions: (1) when a 5:1 trawl warp-depth ratio was used, the doors appeared to lean inward, i.e., toward the brackets; (2) with a 4:1 ratio, the doors appeared to lean outward, i.e., on their backs; and (3) with a 3:1 ratio, the doors appeared to be towing on their forward end or nose. Placement of the transducers on the doors at angles determined from the results of those conclusions provided the clearest recordings.

After satisfactory recordings were obtained from each measurement parameter individually, the transducers were electrically grouped together to produce a recording of all parameters simultaneously. The depth of the water below the vessel's keel was also included on the recording and proved to be of significant value in analysis of collected data.

To determine the tidal influence upon the trawl, "trailing-buoys" were set out at the corners of a 2-mile-square plot. Tidal direction was determined by observing the alignment of a small "trailing-buoy" in relation to its main buoy. The "trailing-buoy" was attached to the main buoy by a line and was free to move about the main buoy and align itself with the tidal direction.

A total of 45 tows was made with, against, and across the tide. One variable was changed during each of the first 27 tows. Eighteen repeat tows were made in order to compare like tows.

A standard No. 41, roller-rigged, manila trawl net was used throughout the cruise equipped with (a) 37 8-inch aluminum ball floats secured to the headrope, (b) 10-fathom ground cables and 5 fathom legs, and (c) trawl doors measuring  $10\frac{1}{2}$  feet by  $4\frac{1}{2}$  feet and weighing approximately 1,200 pounds. The doors were approximately 240 pounds lighter than those used during the previous instrumentation cruises.

The method used for determining the net dimensions was essentially the same as that used during the previous cruises. An excep-

tion, however, was the elimination of the headrope switching unit. By grouping together all of the transducers electrically, the need for the switching unit was eliminated.

Measurement data were obtained as follows:

1. The maximum distance recorded between the trawl doors was 139 feet. (Measurement obtained while towing at 2.92 knots or 190 engine r.p.m., and using a 5:1 trawl warp-depth ratio.)

2. Minimum trawl-door spread while towing in a "straight line" was 86 feet. (Measurement obtained while towing at 200 r.p.m. and using a 3:1 warp-depth ratio.)

3. The maximum distance recorded between the wing-ends was 53 feet. (Measurement obtained while towing at 190 r.p.m., and using a 5:1 warp-depth ratio.)

4. Minimum wing-end measurement was 36 feet. (Measurement obtained while towing at 200 r.p.m. and using a 3:1 warp-depth ratio.)

5. The headrope height, measured at the center, varied from 7 to 9 feet. The smaller measurement occurred during maximum wing-end spread; the larger measurement occurred during minimum wing-end spread.

6. Average trawl-door spread during all tows made was: (1) with the tide - 114.3 feet, (2) against the tide - 114.5 feet, and (3) across the tide - 115.1 feet.

7. Average trawl-door measurement of the tows made during the times when the tidal flow was estimated to be less than one knot was: 113.6 feet with the tide; 113.1 feet against the tide; and 114.9 feet across the tide.

8. Average trawl-door measurement of the tows made during the times when the current was estimated to be more than one knot but less than two knots was: 115.3 feet with the tide; 116.7 feet against the tide; and 115.4 feet across the tide.

9. The velocity of the tidal current in the cruise area was considered to be very slight during the period of the cruise. An area where tides are stronger would, in all probability, produce different results.

Note: See *Commercial Fisheries Review*, June 1963 p. 37.

## North Pacific Exploratory Fishery Program

### PELAGIC TRAWL TESTED AS A HIGH-SEAS PACIFIC SALMON SAMPLING DEVICE:

M/V "John N. Cobb" Cruise 61 (August 5-September 14, 1963): The principal objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb was to determine the salmon catching efficiency of the Cobb pelagic trawl compared to that of gill nets. The Bureau's biological research vessel George B. Kelez co-operated in the tests.

The pelagic trawl was tested under the following variable conditions:

(1) Direction of towing the pelagic trawl relative to the direction of migratory movement of salmon (parallel in opposite directions and perpendicular in opposite directions).

(2) Depth of towing (surface and subsurface).

(3) Time of day (night and day towing).

The Mark II Cobb pelagic trawls rigged to spread in a conventional manner with two aluminum Cobb pelagic hydrofoils and 60-fathom bridles were used during the entire cruise.

Gear modifications used during the first 26 drags included: (1) 51 "Phillips" trawl floats on headrope; and (2) full length cod end liner of  $\frac{1}{2}$ -inch mesh.

Gear modifications used during the last 17 drags included: (1) 81 "Phillips" trawl floats on headrope; and (2) cod end liner not used.

Distance of towing behind the vessel during surface drags was 105 fathoms (45 fathoms of towing warp plus 60 fathom bridles).

Deepest depth tow was approximately 175 fathoms. Depth of net during subsurface tows was determined by triangulation using cable angle and length of towing cables.

Pelagic trawling operations by the John N. Cobb were conducted south of Adak, Alaska, in the same general area in which gill nets were being fished by the George B. Kelez. Distances offshore ranged from one mile to 30 miles. Proximity of trawling stations to gill net stations ranged from 3 to 9 miles. Echo-sounding recordings were made at all stations.

A series of four surface tows were usually made each day (or night). The first tow was made in an easterly direction (opposite to the direction of movement of fish); the second, southerly; the third, westerly; and the fourth, northerly. Whenever weather and time permitted, an additional two tows were made. The additional tows were usually made in the transition periods of dusk and dawn.

Six subsurface tows were made during the cruise. These consisted of one combination surface and subsurface tow made at night, one 5-fathom depth tow at dusk, three tows at depths of 40 fathoms, 50 fathoms and 57 fathoms during daylight hours, and one daytime oblique tow from the surface to a depth of 175 fathoms. Directions of subsurface tows were also made parallel in opposite directions and perpendicular in opposite directions to migratory movements of the salmon.

Although most drags were of one hour duration, 6 drags were 2 hours long and 2 drags were each  $4\frac{1}{2}$  hours long.

A total of 43 drags was made during which 96 immature sockeye salmon and 19 immature chum salmon were captured. Catch rates per tow ranged from 0 to 22 and averaged 2.7 salmon per tow. Weights of salmon averaged about  $1\frac{1}{2}$  pounds and lengths averaged about 35 centimeters (14 inches). The best one-hour tow produced 9 sockeye and 4 chum salmon. The best two-hour tow produced 21 sockeye and 1 chum salmon. Two successive  $4\frac{1}{2}$  hour tows produced 8 sockeye and 1 sockeye, respectively.

Prior to removal of the small mesh cod end liner, several species of fish, other than salmon, were taken in small numbers. Following removal of the liner, incidental catches were limited to jellyfish, squid, and pomfret. One nighttime surface tow produced a young fur seal. Incidental catches included: Prowfish, myctophids, sand lance, saury, pomfret, smelt, lamprey, liparids, wolf eel, fanged viper fish, turbot, and several unidentified "smelt-like" and "cod-like" fishes.

In relation to gill-net catch rates of the George B. Kelez (usually in excess of 200 salmon per night), catch rates of the John N. Cobb were poor. Although the gill nets captured both immature and mature salmon and steelhead trout, the Cobb pelagic trawl catches were limited to immature sockeye and immature chum salmon.

Salmon taken with the Cobb pelagic trawl were usually gilled in the top intermediate section of the net suggesting they were swimming within a few feet of the surface. Those few salmon captured in the cod end of the net were usually larger than average and in excellent condition, probably suitable for tagging.

Surface water temperatures ranged from 44° F. near shore to 51.5° F. 30 miles offshore with lowest catch rates of salmon being made at the two extremes. Small fish such as sand lance, smelt and "cod-like" species were commonly caught near shore but were absent in offshore catches. Saury and pomfret were caught only in the offshore, higher temperature water.

No relationship between catch rate and direction of towing was noted.

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#### SURVEY OF DEEP-WATER MARINE FAUNA OFF MOUTH OF COLUMBIA RIVER CONTINUED:

M/V "Commando" Cruise 11: The eleventh in a series of cruises to survey the fauna in 50-850 fathoms southwest of the mouth of the Columbia River was completed on September 5, 1963, by the U.S. Bureau of Commercial Fisheries chartered research vessel Commando. The 18-day cruise was conducted in cooperation with the Atomic Energy Commission.

A standard 400-mesh otter trawl with a 1½-inch mesh liner in the cod end was used to monitor stations from 50 to 450 fathoms, and a 72-foot semiballoon shrimp trawl was used at stations greater than 450 fathoms. A hydraulically-driven drum for the handling of the trawl was used for the first time. The drum, which was fixed to the after deck of the vessel, facilitated the setting and retrieving of the trawl. After making successful tows at 650, 750, and 850 fathoms, trawling in deep water was suspended 1 day early because of damage to the shrimp nets.

Commercial species of fish during the survey included sablefish (Anoplopoma fimbriae), ocean perch (Sebastodes alutus), and other species of rockfish (Sebastodes), Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus), Petrale sole (Eopsetta jordani), English sole (Parophrys vetulus), lingcod (Ophiodon elongatus), and one halibut (Hippoglossus stenolepis). Sablefish were collected at all stations from 50 to 650 fathoms. The

largest catches of sablefish occurred at 50 fathoms (900 pounds) and from 350 to 400 fathoms where catches ranging from 700 to 1,000 pounds were taken. Ocean perch were taken from 75 to 250 fathoms; the catch per 1-hour tow between 125 and 200 fathoms ranged from 1,400 to 1,700 pounds. A catch of 900 pounds of greenstripe rockfish (Sebastodes elongatus) was taken from 75 fathoms, and catches of 300 and 200 pounds of bocaccio (S. paucispinis) and silver-gray rockfish (S. brevispinis), respectively, were taken from 100 fathoms. A half-hour tow at 50 fathoms collected 1,500 pounds of Dover sole and 800 pounds of rex sole. Dover sole were taken at all stations to a depth of 450 fathoms; catches of 800 to 1,125 pounds per 1-hour tow occurred at 175 and 200 fathoms. The catch of English sole, Petrale sole, and lingcod was small.

A 2,000-pound catch of hake (Merluccius productus) was taken in 50 fathoms. Rattails (Coryphaenoides) were dominant in the fish catches from 650, 750, and 850 fathoms.

Unusual fish encountered during the cruise were an angler fish (Ceratioidei) and a Beryciform taken during trawling at 275 and 350 fathoms. Although both forms were found in the trawl after bottom tows, it is believed that they were collected from mid-depths.

Commercial invertebrates found along the Columbia River trackline were Dungeness crabs (Cancer magister), scallops (Patinopecten caurinus), pink shrimp (Pandalus jordani), and tanner crabs (Chionoecetes tanneri). Six scallops and 36 Dungeness crabs were taken from 50 fathoms. Small quantities of pink shrimp were found from 75 to 125 fathoms. Adult tanner crabs were taken in large numbers at only 2 depths--350 and 375 fathoms. Crabs from those depths were predominantly ovigerous. Sixty-five pounds of juvenile crabs were collected in a 1-hour drag at 650 fathoms.

Samples of fish were collected and delivered to the Laboratory of Radiation Biology, University of Washington, for radiological analysis.

The cooperative program with the Oregon Fish Commission to study the migrations of sablefish and Dover sole in the area of investigation was continued. Tagging was conducted at stations from 50 to 450 fathoms.

The study of heterotrophic marine bacteria by personnel from the College of Fisheries,

University of Washington, was continued during the cruise.

Note: See Commercial Fisheries Review, July 1963 p. 47.

## Oceanography

### DEEP EQUATORIAL COUNTERCURRENT IN ATLANTIC OCEAN DISCOVERED:

A Soviet scientist of the U.S.S.R. Marine Hydrophysical Institute has described the discovery of an undercurrent in the Atlantic Ocean corresponding to the Cromwell countercurrent in the Pacific Ocean. The Atlantic current was measured during the tenth voyage of the Mikhail Lomonosov. Automatic current measuring devices were attached to anchored buoys. They operated to a depth of 1,200 meters for periods from 26 to 62 hours, and recorded at 5-minute intervals. At 6 stations the currents were measured simultaneously with 2 buoys spaced 24 miles apart. From 4,500 current measurements taken at 17 stations, it was established that there is a deep countercurrent in the Atlantic Ocean. It has been named the "Lomonosov Deep Equatorial Countercurrent."

The Soviet scientist reported that the Lomonosov and Cromwell countercurrents differ in the following respects: (1) the Lomonosov countercurrent is considerably less strong than the Cromwell countercurrent; (2) the maximum velocity of the Lomonosov countercurrent—116 centimeters per second—is at a depth of about 50 meters, whereas the Cromwell countercurrent's maximum velocity of 150 centimeters per second is at a depth of about 100 meters; (3) the lower boundary of the Lomonosov countercurrent is above 200 meters, whereas in the Cromwell countercurrent it is at about 300 meters; (4) at a distance of about 2 miles to the south of the equator and near 30° W. longitude, the Lomonosov countercurrent's lower boundary is less than 100 meters.

In the Atlantic Ocean near the western boundary of the Gulf of Guinea, at a depth of 800 meters, there is a second deep countercurrent with a maximum velocity of 15 centimeters per second and a direction of 42°.

The Soviet scientist recommended that an effort be made to find an equivalent countercurrent in the Indian Ocean. (Newsletter, National Oceanographic Data Center, Aug. 31, 1963)

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### NEW TROPICAL RESEARCH LABORATORY PLANNED:

The United States oceanographic program received new support with the announcement on September 13, 1963, by Assistant Secretary of the U. S. Department of the Interior Frank P. Briggs of the selection of Miami, Fla., for a new tropical oceanographic-fisheries research center. The new center, which will be operated by the U. S. Bureau of Commercial Fisheries, will be specially geared to research in tuna and other tropical fisheries. An appropriation for planning and designing the laboratory has been approved by Congress. Construction is scheduled to start late in 1964 if funds are available.



## Oregon

### REMOVAL OF ABANDONED DAM ON YAMHILL RIVER OPENS NEW SALMON SPAWNING GROUNDS:

An obsolete navigation lock and dam on the lower Yamhill River was breached in the fall of 1963. The structure, located near Lafayette, Oreg., had long blocked ready access by salmon to 600 miles of potential spawning and rearing grounds in the Yamhill system, according to the Oregon Fish Commission.

With the assistance of Fish Commission specialists, dynamite was used to substantially lower a section of the old dam to allow the passage of salmon and steelhead. That was a major step in the long range salmon rehabilitation plans for the Willamette River system, of which the Yamhill is a tributary.

A fish ladder was present in the old navigation facility at the time of its completion by the U. S. Army Corps of Engineers in 1900, but high water removed the ladder, and it was never replaced. Information is incomplete on salmon runs that may have existed in the Yamhill River prior to the construction of the dam. The Corps of Engineers abandoned the lock and turned the property over to Yamhill County in 1953.

Oregon Fish Commission scientists feel the outlook now is bright for the river system to become an important spawning and nursery ground for both salmon and steelhead. The low cost of the project makes it a conservation bargain. Experimental introductions of

small silver salmon were made as early as 1954 after extensive biological surveys of the river system indicated an excellent potential for salmon production. Over 700,000 young silver salmon have been released into the Yamhill system in the last 9 years. Many of those fish grew to downstream migrant size and later returned in substantial numbers as adults. Yamhill Dam, however, prevented full development of natural runs. Only during extremely high water, were adult fish able to pass the barrier. With the removal of the obstruction, extensive plantings of yearling silvers will be made in the river with an excellent chance for success.

Plans called for additional work in the near future to improve habitat in the upper tributaries of the Yamhill. Other obstructions in the form of rock ledges and mill dams will be laddered or removed. Evaluation of the program will undoubtedly have worth in developing similar streams elsewhere. (Fish Commission of Oregon, September 26, 1963.)

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#### WILLAMETTE RIVER HATCHERY COLLECTS RECORD NUMBER OF CHINOOK SALMON EGGS:

The highest spring chinook salmon egg take in twenty years is in prospect at the Oregon Fish Commission's Dexter Dam egg-taking facility on the Middle Willamette River, the agency's fish culture director announced on October 1, 1963.

Hatcherymen from the Willamette River station near Oakridge are expected to take over 10 million eggs this season from adults currently on hand, more than doubling last year's excellent take of  $4\frac{1}{2}$  million. Over 5,000 adult chinook will be handled this season, the agency director said. This is the largest number of mature fish taken at Dexter since the fish-holding facility was established in 1955. Survival of adults over the summer months was excellent this year due at least in part to cooler water temperatures. During some seasons the mortality of ripening adults has been high as a result of disease outbreaks abetted by relatively warm water in the holding pond.

If all goes well, future hatchery-produced runs on the Middle Willamette may be even higher. This year's excellent spring run--essentially 4 and 5 year old fish--originated from annual releases of  $1\frac{1}{2}$  million yearlings

for each of the 1958 and 1959 broods. Liberations of yearlings of the 1960 Middle Willamette brood totaled 1 million. Of the 1961 brood some 1.5 million were released downstream. Now on hand at the Willamette Salmon Hatchery at Oakridge are 3.4 million yearlings of the 1962 brood awaiting liberation during late winter.

Temperature conditions in the Middle Willamette mainstem are such that during most years relatively little survival can be expected from eggs deposited naturally in the stream. Because of this fact, the mainstem Middle Willamette spring chinook run is considered to be maintained, for all practical purposes, by Fish Commission hatchery operations.

The 1963 total Willamette River spring chinook run was calculated at 48,100 fish of which approximately 13,500 or about 28 percent were taken by sport fishermen. The total run size during other recent years was 24,200 during 1960, 27,500 during 1961, and 38,200 in 1962.



#### Oysters

##### DISEASE MSX DECLINES IN VIRGINIA:

Relatively few oysters in Virginia are dying from the oyster disease MSX this year, according to the Head of oyster research at the Virginia Institute of Marine Science. He cautioned against a misinterpretation of this fact, however, since few oysters remain to become affected in the heavily infested areas. Nevertheless, heavy losses such as those experienced in 1960 and 1961 have ceased, and the surviving young oysters in the infected area do not show high mortality.

Planters, acting on advice given them by the Institute as to when oyster seed should be put down in order to avoid MSX infections as long as possible, have cautiously made trial plantings in Mobjack Bay, Egg Island off Pocoosie River, and the lower York River. Samples from each planting have been examined at the Institute for occurrence of MSX.

All of those plantings have been, or will be, harvested early and the results are fairly encouraging. No oysters have been left on growing grounds for more than one summer. This was made possible by selecting large seed oysters from the James River and planting them thin. Good growth and fat oysters resulted.

Despite signs of a slowly recovering oyster industry in lower Chesapeake Bay, danger signals still exist. Small-scale experimental transplantings of oysters by the Institute indicate that MSX remains active in some areas.

Technicians from the Institute have placed oysters in trays in all the MSX infected waters of the State and have regularly tested the oysters for signs of infection. The tray-grown stocks have been reliable indicators of conditions on commercial beds in respect to the occurrence of MSX and the mortalities caused by it.

For 3 years prior to 1963, MSX killed about 70 percent of the test oysters placed in Mobjack Bay and in lower York River within 1 year of transplanting. This year MSX infections occurred in early summer and oysters began dying in August and September as usual. The difference between this and prior summers is that the losses have been lower and the number of oysters infected with MSX has been less. Mobjack Bay and lower York River still seem to be the most seriously afflicted areas. For example, a recently examined group of oysters from a commercial planting in Mobjack Bay was found to be almost fifty percent infected. Hampton Roads appears to be making a recovery because oysters planted on Hampton Bar and on Egg Island beds exhibited only moderate levels of infection in late August 1963.

"One especially encouraging development is the relative absence of MSX from James River seed beds at present," reported the Director of oyster research at the Institute. "Planting disease-free seed is of utmost importance for survival of oysters to market size in epidemic areas." Planters who used MSX-infested seed from the mouth of Elizabeth River did not reap a harvest because MSX destroyed the crop. He also cautioned that planters who wish to be successful with short-term oyster plantings in MSX-infested areas must be aware of the habits of MSX in order to avoid unnecessary infections. Both planting and harvesting must be carefully timed and oysters must be in a position to grow to market size within a relatively short period. Two- and three-year culture of oysters, as in pre-MSX days, is far too much of a gamble with MSX around. (Virginia Institute of Marine Science, October 2, 1963.)

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### JAMES RIVER SPATFALL FAILS AGAIN IN 1963:

Oyster spatfall in the James River seed area has been inadequate to maintain seed stocks for the third year in succession, according to the Head of oyster research at the Virginia Institute of Marine Science.

The scientist said that three successive years of setting failure cannot be ascribed easily to chance circumstances or weather. "Something has changed in the James River. The efforts of the industry, the Virginia Commission of Fisheries, and the Virginia Institute of Marine Science must be devoted to locating and correcting the causes before the seed area is depleted," he stated. The short term outlook for the James River is dim, although setting in other areas of the Chesapeake Bay system appears successful. The situation can be helped by bringing in other rivers as seed oyster areas."

Twenty years of records compiled by scientists at the Virginia Institute of Marine Science show that in the past setting on the best James River beds averaged 5 to 15 spat per test shell. In 1962, the average for the important area between Brown Shoal and Wreck Shoal was less than one-half spat per shell. Upriver and inshore areas that usually show some spatfall during good years received virtually none in 1962. Some 90,000 bushels of shell planted at Blunt Point early in the summer of 1962 received almost no set.

During the summer of 1963, setting was monitored by the Institute on a weekly basis at 17 test stations. The stations were located near the channel, inshore, upriver, and down river to determine the distribution of spatfall. Technicians exposed clean shells for one week and then examined them under a microscope for spat. They found that no appreciable setting had occurred as late as September 17, 1963, except at Brown Shoal near the channel. Occasional spat were found at all stations. Test shells left in wire bags for the whole setting season had not been collected by the end of September. Natural cultch will be closely examined by the Virginia scientists to assess the level of spatfall on public beds.

It was pointed out that there was no evidence weather conditions were unfavorable for setting in 1963 (record levels of setting occurred in other areas of Chesapeake Bay in spite

of this year's drought). The two previous years of spat failure were wet ones, whereas 1963 was exceptionally dry with very high salinities in the James River. Oysters were very poor and weak in the spring and early summer of 1962, but in 1963 their condition was excellent in the James River. Large quantities of spawn could be seen in the oysters until after September 1, 1963.

"There appears to be no scarcity of brood oysters and spawn in the seed area; therefore, it can be deduced that the main source of brood stock for the James River seed area may be in Hampton Roads," the Director of oyster research at the Institute stated. It is known that many organisms ride bottom currents upriver once they get in deep water and this applies to young oysters. The scarcity of oysters in Hampton Roads as a consequence of the MSX epidemic continues because planting has not been resumed. Preliminary steps have been taken by the Virginia Commission of Fisheries to re-stock public grounds in the Newport News-Nansemond area by planting shells. The Virginia scientist said that planting of private beds on Hampton Bar with large seed oysters may be even more important.

Studies by the Institute show that successive failures of spatfall in the seed area have affected the quality of seed oysters. Since essentially the same year classes (1959 and 1960 mostly) of oysters are being harvested each year, current seed stock are large and have a low count per bushel, whereas formerly the count was high and the average size much smaller. Large seed oysters permit early harvesting, but total yield is eventually reduced. The large seed oysters are particularly important to planters operating in areas where long culture is hazardous because of MSX. However, last year a large proportion of James River seed oysters were culled and sold directly to shuckers or canners for marketing. This practice is expected to become more extensive during the coming year. It seriously reduces the supply of seed oysters available for planting and is a misuse of the James River seed area in the judgment of Institute scientists.

Whereas MSX has declined in James River for lack of oysters to sustain an epidemic, oyster drills are exceptionally active on Brown Shoal and the lower seed beds. Spat are being killed as fast as they set on Brown Shoal and considerable numbers of oysters up to 2 inches are dead. Drills have been seen as far upriver as Miles' watch house. High salinities have favored drill activity and movement upriver.

It is unfortunate that setting should fail in the James River just when the Virginia Commission of Fisheries has initiated large plantings of shells which should have boosted seed production enormously. However, the shells will last and be useful when setting of oysters returns to the James. The Institute recommended the use of every feasible means to aid nature in the recovery of setting patterns. Any closures of brood stock and seed areas until the proper time for harvesting should be accepted by all segments of the industry. Already the Virginia Commission of Fisheries has planted shells in deep waters near Wreck Shoal to produce a deep-water stock of brood oysters. If private planters fail to replant beds in Hampton Roads for fear of MSX, it may become necessary to move some public oysters to areas such as Hampton Bar and Newport News shoals. Shell plantings will not suffice in those areas because young oysters are readily killed by drills.

By careful use of multiple seed areas, State agencies and private interests acting on scientific advice can probably produce all the seed and oysters Virginia can utilize. (Virginia Institute of Marine Science, September 30, 1963.)



## Plankton

### STUDY OF TROPICAL PHYTOPLANKTON:

The National Science Foundation has issued a research grant of \$74,200 to the Institute of Marine Science, University of Miami, for a 3-year study of tropical phytoplankton—tiny plants that drift free in the sea. The study will be directed by the scientist in charge of the Institute's microbiology section. The new research program, titled "Ecology of Phytoplankton in Semi-Tropical Environments," is for the purpose of determining the distribution, significance, and productivity of the various planktonic plants and bacteria in selected areas. Samples will be collected and experiments conducted across the Gulf Stream between Biscayne Bay, Fla., and Cat Cay in the Bahamas. The groups of organisms involved in the study are diatoms, flagellates, blue-green algae, and bacteria. Knowledge of the extent and behavior of those minute plants may help scientists learn more about primary production in the sea.



## Salmon

### MATURE CHINOOK SALMON SPAWN IN SACRAMENTO RIVER DURING MAY-JUNE 1963:

Mature chinook salmon spawning at Keswick Dam on California's Sacramento River during May and June 1963 stirred considerable interest among fishery biologists. Little is known about chinook salmon spawning so early in the northern hemisphere.

Approximately 150,000 eggs were taken from 50 mature salmon, and an additional 500 fish were trapped, hauled downstream, and released into the river to spawn naturally. After incubation and hatching, half of the young salmon were released as unfed fry in the Sacramento River at Princeton, Calif., which is below the major water-use diversions. The remainder of the fry were transferred to the Coleman National Fish Hatchery for rearing and release as fingerlings.

In addition to contributing to the ocean and San Francisco Bay sport and commercial salmon catch, the run of fish provides excellent sport fishing from January to April in the upper Sacramento River. Federal and State conservation agencies are observing the buildup of this winter run strain of chinook salmon in

the Sacramento River with considerable interest. If the number of fish at Keswick Dam continue to increase, the present salmon rearing program may be altered in order to take advantage of those gains to provide more sport and commercial fishing.

\* \* \* \* \*

### SAN JOAQUIN RIVER FLOW REVERSAL THREATENS SALMON RESOURCE:

The U. S. Bureau of Reclamation began pumping additional water into the San Joaquin River in California on September 15, 1963, in an effort to save the river's salmon resources. In past years, as many as 50,000 salmon returned to spawn in the San Joaquin River during late September, October, and November. But during the past two spawning seasons, salmon runs in the river have dwindled to less than 3,000 fish.

A key reason for the decline is the decreased flow of water in the San Joaquin, according to an official of the California Department of Fish and Game. Toward the end of summer when the river is normally low, the water diversions in the Delta and incoming tides produce a flow reversal. In effect, the water flows upstream.

The California Department of Fish and Game believes that a positive downstream flow of a salmon's home stream is essential for salmon to properly orient themselves. It is believed that salmon "home" on the characteristic odors of the streams in which they are spawned. Under conditions of flow reversal in the San Joaquin, little or no water from the home stream reaches the coastal area, and salmon search in vain for home stream waters.

To solve the problem, the Federal Bureau of Reclamation in mid-September increased its pumping of water from the Delta in order to divert 400 cubic feet of water per second from the Delta Mendota Canal into the San Joaquin River six miles north of Patterson, Calif. It was believed that the increased flow into the San Joaquin would push back the tidal waters and end the flow reversal of the river. (California Department of Fish and Game, September 14, 1963.)

\* \* \* \* \*

### STREAM IMPROVEMENT AIDS SPAWNING FISH:

The application of trout stream improvement techniques to aid spawning salmon is

being tested on a small tributary of the lower Columbia River with promising results, according to the Director of the Oregon Fish Commission. The experiment is being conducted on Plympton Creek near Westport, Oreg; and involves creating resting pools, deeper channels to facilitate upstream movement, and shelter areas to provide salmon respite from harassment by natural enemies, including humans. The work on Plympton Creek may have application on other Northwest salmon-spawning streams.

Plympton Creek is a stream where spawning salmon have long experienced difficulty in negotiating the lower and shallower stretches of water in order to reach spawning gravel. To aid the fish, dams, deflectors, and ripraps of poles and rock have been constructed in order to create a series of pools with connecting deep-water channels. This provides resting holes, spawning areas, and transportation water for the salmon. The program, which was launched in September 1963, is expected to be completed in the spring of 1964, after a shutdown of construction activities this winter to prevent interference with spawning fish.

Counts of mature chinook in Plympton Creek in recent years have numbered between 50 and 100 fish. This season, an estimated 900 salmon are in the stream. However, unusually favorable water conditions probably account for much of the upsurge in fish numbers. It is during years of normal low water when the stream improvement structures are expected to be of greatest value.

Financing for the Plympton Creek program was provided by the Federal Government under terms of the Columbia River Fisheries Development Program administered by the U. S. Bureau of Commercial Fisheries. (Fish Commission of Oregon, October 2, 1963.)



### Shrimp

#### FUTURES TRADING FOR FROZEN SHRIMP MAY OPEN IN CHICAGO:

The Chicago Mercantile Exchange contemplates opening a futures market for frozen shrimp, according to a statement to the press by the President of the Exchange in late September 1963. He emphasized that the Exchange is not going into the shrimp business as the Exchange does no buying or selling, but pro-

vides a point where contracts for future delivery may be traded, in the same manner as grain futures at the Chicago Board of Trade. This provides price insurance by allowing processors and handlers to sell futures contracts against their inventory and buy such contracts to meet contemplated needs.

The Exchange plan would open contracts for delivery in January, March, and September 1964. The plan calls for trading in 5,000-pound units of U. S. Grade-A raw, frozen, grooved, brown, headless Gulf shrimp with a count of 16/20 to the pound (restricted to the domestic catch in the Gulf of Mexico). All shrimp traded would be required to meet the standards promulgated by the U. S. Bureau of Commercial Fisheries.

\* \* \* \* \*

#### UNITED STATES SHRIMP SUPPLY INDICATORS, SEPTEMBER 1963:

Item and Period	1963	1962	1961	1960	1959
(1,000 Lbs., Heads-Off) . . . . .					
<u>Total landings, So. Atl. and Gulf States:</u>					
November . . . . .	-	11,604	9,996	14,454	12,412
October . . . . .	-	14,699	12,696	21,888	19,801
September . . . . .	18,800	13,182	9,691	18,832	18,330
August . . . . .	19,554	12,332	10,944	20,441	18,595
January-July . . . . .	54,979	44,430	41,530	58,521	53,004
January-December	-	105,779	91,396	141,035	130,660
Quantity canned, Gulf States 1/ . . . . .					
November . . . . .	-	2,727	2,175	1,535	2,122
October . . . . .	-	4,454	2,065	2,480	2,324
September . . . . .	3,400	1,727	598	2,222	1,935
August . . . . .	3,040	1,333	1,090	4,427	2,228
January-July . . . . .	13,876	11,089	7,756	14,836	12,876
January-December	-	23,210	14,500	26,394	22,659
Frozen inventories (as of end of each mo.) 2/ . . . . .					
November 30 . . . . .	-	27,500	20,668	37,264	37,334
October 31 . . . . .	-	21,315	17,811	31,209	33,057
September 30 . . . . .	3/	12,843	13,361	24,492	26,119
August 31 . . . . .	4/ 24,803	12,754	12,728	20,171	23,780
July 31 . . . . .	4/ 25,460	13,677	14,849	17,397	22,352
June 30 . . . . .	4/ 24,047	13,798	19,416	15,338	19,283
May 31 . . . . .	4/ 25,114	13,904	24,696	17,540	21,137
Imports 5/ . . . . .					
November . . . . .	-	17,964	14,852	13,516	10,269
October . . . . .	-	18,279	16,813	14,211	15,340
September . . . . .	-	9,696	8,629	8,190	7,541
August . . . . .	8,598	7,381	6,743	6,406	5,107
January-July . . . . .	81,487	72,265	63,803	58,684	57,687
January-December	-	141,183	126,268	113,418	106,555
. . . (¢/lb., 26-30 Count, Heads-Off) . . . . .					
Ex-vessel price, all species, So. Atl. & Gulf Ports:					
December . . . . .	-	82.9	75.2	54.2	48.4
November . . . . .	-	84.5	73.5	54.0	46.2
October . . . . .	-	90.0	68.7	53.0	44.4
September . . . . .	6/ 55-61	90.9	70.1	52.2	46.4
August . . . . .	6/ 57-71	83.6	66.1	52.0	46.9
July . . . . .	6/ 57-78	82.1	55.8	54.6	49.2
June . . . . .	6/ 72-83	84.4	53.7	64.1	60.7
May . . . . .	80.9	83.7	52.8	62.9	63.3

(Table continued on next page)

Item and Period	1963	1962	1961	1960	1959
. . . . . (c/lb., 26-30 Count, Heads-Off).					
<b>Wholesale price froz. brown (5-lb. pkg.) Chicago, Ill.:</b>					
December . . . . .	-	101-107	91-92	68-70	64-66
November . . . . .	-	105-110	89-92	69-73	60-65
October . . . . .	-	108-115	83-90	69-73	59-62
September . . . . .	73-77	113-118	87-90	65-70	62-64
August . . . . .	75-81	110-112	76-81	64-67	62-64
July . . . . .	80-97	3/	70-75	72-77	62-74
June . . . . .	95-102	102-104	67-72	76-77	73-74
May . . . . .	98-103	96-103	67-69	74-77	70-76

1 Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3. The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 31.0 pounds per case).

2 Raw headless only; excludes breaded, peeled and deveined, etc.

3 Not available.

4 Inventory of May 31, 1963, includes 553,000 pounds; June 30, 1963, includes 667,000 pounds; July 31, 1963, includes 925,000 pounds; and August 31, 1963, includes 1,011,000 pounds for firms not reporting previously.

5 Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

6 Range of sources at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Texas, only.

Note: Data for 1963 are preliminary. September 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

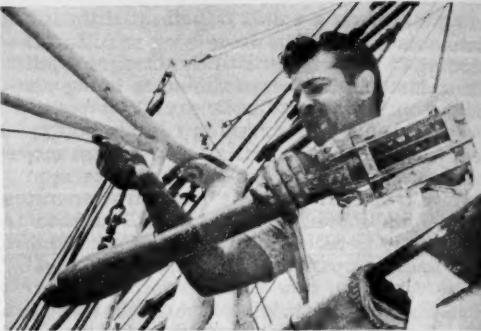
## Tuna



### PACIFIC COAST PURSE SEINERS COOPERATE WITH SCIENTISTS IN THERMOCLINE STUDY:

The masters and crews of the California tuna purse seiners Caribbean, Carol Virginia, Elsie A, Elsinore, Nautilus, Royal Pacific, and West Point are assisting scientists at the U. S. Bureau of Commercial Fisheries, San Diego Biological Laboratory, in a study to determine whether the depth and strength of the thermocline affects rate of success of purse seining for tuna. The thermocline is the region of sharp temperature change which separates the warm surface water (mixed layer) from the cold water of the depths. The warm surface mixed layer above the thermocline varies greatly in thickness depending on location and time of year. For example, in the eastern portion of tropical oceans it varies from 50 feet or less to 200 feet, whereas in the western margins it is much thicker, frequently more than 300 feet. The regions where purse seining for tuna is carried on successfully, notably the eastern tropical Pacific, ordinarily have thermoclines that can be reached by the nets. It might be that the thermocline acts as a barrier to tuna at times and limits their escapement from the net.

The thermocline data so far available from the cooperating seiners suggests that as the depth of the thermocline increases past about 60 feet, the percent of sets which are successful may decrease, and as the temperature gradient in the thermocline increases, the percent of successful sets may increase.



First mate on Royal Pacific, prepares to lower bathythermograph.

However, proof of the thermocline's effect on purse seining has not been established with the limited data available. What is needed is a great many more observations on the thermocline taken at the time purse seine sets are made.

Equipment required to measure water temperatures at depths consists of a bathythermograph (BT) and a small winch to lower and retrieve it. The BT is a torpedo-shaped device which records, on a coated glass slide, temperature against depth as it is lowered below the surface.

The San Diego Laboratory has installed the necessary equipment on the seven vessels noted. The U. S. Navy is also interested in obtaining more information on thermocline depths and has assisted by furnishing some of the BT's and winches. Laboratory technicians accompanied the vessels on the first trip after the equipment was installed to take the observations and to instruct crew members in the procedure. BT casts and the necessary record keeping are not particularly time consuming and can fit into a vessel's normal fishing schedule. It is planned to obtain the cooperation of additional vessels in order to answer as quickly as possible the question of whether seining success is related to the depth and strength of the thermocline.



### United States Fisheries

#### COMMERCIAL FISHERY LANDINGS JANUARY-AUGUST 1963:

**Total Landings:** Fish and shellfish landings in the United States during the first 8 months of 1963 were down

13 percent compared with the same period of 1962. Landings were about 419 million pounds less than a year ago--due principally to greatly reduced landings of menhaden, salmon in Alaska, tuna in California, and ocean perch in New England.

**Menhaden:** Total landings for the first 8 months of 1963 amounted to about 1.3 billion pounds--336 million pounds less than during the same period in 1962. During August, there was a marked drop in quantity in every State along the Atlantic and Gulf Coasts, except Louisiana.

**Salmon:** On the basis of the reported pack of canned salmon, it was estimated that the 1963 catch in Alaska

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1963 and 1962				
Species	Period	1/1963	1962	Total 1962
Anchovies, Calif. 2/	7 mos.	..... (1,000 Lbs.) .....	.....	.....
		2,100	1,312	2,252
Cod:				
Maine .....	7 mos.	1,300	1,583	2,260
Boston 3/	8 "	13,500	10,685	21,213
Gloucester 3/	8 "	2,300	2,265	3,823
Total cod .....		17,100	14,533	27,296
Haddock:				
Maine .....	7 mos.	1,200	1,158	2,545
Boston 3/	8 "	56,900	61,720	83,057
Gloucester 3/	8 "	13,200	10,902	16,089
Total haddock .....		71,300	73,780	101,691
Halibut: 4/				
Alaska .....	8 mos.	20,600	24,817	27,496
Wash. & Oreg. .....	8 "	10,500	11,322	12,404
Total halibut .....		31,100	36,139	39,900
Herring, Maine .....	7 mos.	62,200	60,008	156,699
Industrial Fish, Me. & Mass. 5/	8 mos.	39,900	22,669	42,741
Mackerel:				
Jack 2/	8 mos.	56,500	41,996	93,414
Pacific 2/	8 "	20,900	23,758	44,980
Menhaden .....	8 mos.	1,271,900	1,607,812	2,249,100
Ocean perch:				
Maine .....	7 mos.	38,400	43,714	69,453
Boston .....	8 "	400	462	909
Gloucester .....	8 "	34,000	44,716	53,619
Total ocean perch .....		72,800	88,892	123,981
Salmon, Alaska .....	to Sept. 22	213,600	272,834	280,000
Sardine, Pacific .....	9 mos.	3,700	13,154	15,363
Scallops, sea, New Bedford (mats) .....	8 mos.	11,700	14,153	19,309
Shrimp (heads-on):				
So. Atl. & Gulf .....	8 mos.	118,700	90,762	168,200
Washington .....	8 "	900	1,200	1,400
Squid, Calif. 2/	7 mos.	7,300	6,854	7,056
Tuna, Calif. .....	to Sept. 21	206,000	224,854	284,559
Whiting:				
Maine .....	7 mos.	13,000	13,935	17,831
Boston .....	8 "	100	166	212
Gloucester .....	8 "	34,100	35,135	53,183
Total whiting .....		47,200	49,236	71,226
Total all above items .....		2,254,900	2,643,946	3,729,167
Other 6/ .....		455,700	480,883	1,510,533
Grand total .....		2,710,600	3,124,829	5,239,700

2/Preliminary.

3/Cannery receipts.

4/Landed weight.

5/Dressed weight.

6/Excludes menhaden.

7/Includes landings for species not listed.

Note: Fish are generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meat only.

amounted to approximately 214 million pounds--about 59 million pounds less than in 1962.

**Tuna:** Landings (including bonito) in California totaled nearly 209 million pounds to September 21, 1963,--a decrease of almost 17 million pounds as compared with the same period in 1962. Purse-seine landings dropped 4 million pounds, and clipper-fleet landings were 10 million pounds lower than during that period in 1962. Transhipments of U.S.-caught fish from South America declined from nearly 5 million pounds in 1962 to 2 million pounds in 1963.

**Scallops:** New Bedford landings totaled nearly 12 million pounds during the first 8 months of 1963--slightly below the 14 million pounds for the same period in 1962.

**Maine Herring:** During the first 7 months of 1963, landings (62 million pounds) were 2 million pounds more than for the same period in 1962.

**Mackerel:** Pacific mackerel landings, amounting to 21 million pounds during the first 8 months of 1963, were down slightly from the 23.8 million pounds during that period of 1962. Landings of jack mackerel (56.5 million pounds) were up 14.5 million pounds.

**Shrimp:** South Atlantic and Gulf landings during the first 8 months of 1963 totaled nearly 119 million pounds--28 million pounds or 31 percent more than the same period in 1962.

**Ocean Perch:** During the first 7 months of 1963, landings in Maine amounted to 38.4 million pounds. In Gloucester, Mass., during the first 8 months of 1963, landings totaled 34 million pounds. Compared with the same periods of 1962, this was a decline of over 5 million and 10 million pounds, respectively.



## U. S. Fishing Vessels

### DOCUMENTATIONS ISSUED AND CANCELLED, AUGUST 1963:

Table 1 - U. S. Fishing Vessels 1/-Documentations Issued and Cancelled, by Areas, August 1963 with Comparisons

Area (Home Port)	Aug. 1963				Jan.-Aug. 1962				Total 1962			
	1963	1962	1963	1962	1963	1962	1963	1962	1963	1962	1963	1962
Issued first documents 2/:												
New England .....	3	2	17	22	28							
Middle Atlantic .....	3	-	15	2	3							
Chesapeake .....	6	3	37	26	43							
South Atlantic .....	7	10	51	31	47							
Gulf .....	35	18	170	78	110							
Pacific .....	7	10	143	110	130							
Great Lakes .....	1	1	4	2	5							
Puerto Rico .....	-	-	2	-	2							
Total .....	62	42	439	271	368							
Removed from documentation 3/:												
New England .....	5	2	38	14	24							
Middle Atlantic .....	2	2	41	28	39							
Chesapeake .....	1	4	13	17	23							
South Atlantic .....	6	3	43	25	38							
Gulf .....	2	2	78	71	104							
Pacific .....	5	6	65	78	111							
Great Lakes .....	2	3	11	15	22							
Hawaii .....	-	-	1	3	3							
Puerto Rico .....	-	-	-	-	1							
Total .....	23	22	290	252	365							

2/For explanation of footnotes, see table 2.

During August 1963, a total of 62 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 42 in August 1962. There were 23 documents cancelled for fishing vessels in August 1963 as compared with 22 in August 1962.

Table 2 - U. S. Fishing Vessels--Documents Issued and Cancelled, by Tonnage Groups, August 1963

Gross Tonnage	Issued 2/	Cancelled 3/
	..... (Number) .....	
5-9 . . . . .	13	6
10-19 . . . . .	15	10
20-29 . . . . .	8	1
30-39 . . . . .	2	3
40-49 . . . . .	3	1
50-59 . . . . .	2	-
60-69 . . . . .	3	-
70-79 . . . . .	8	-
80-89 . . . . .	5	-
110-119 . . . . .	1	-
120-129 . . . . .	-	2
260-269 . . . . .	1	-
770-779 . . . . .	1	-
Total . . . . .	62	23

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes 3 undocumented vessels in August 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 43 in 1963; 1 in 1962; 1 in 1960; 1 in 1957; 1 in 1954; 1 in 1953; 13 prior to 1951; and 1 unknown.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

\* \* \* \* \*

### FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JULY 1-SEPTEMBER 30, 1963:

From the beginning of the program in 1956 through September 30, 1963, a total of 1,296 loan applications for \$34,981,977 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 677 applications (\$15,563,707) have been approved, 474 (\$12,156,761) have been declined or found ineligible, 150 (\$6,009,843) have been withdrawn by applicants before being processed, and 25 (\$453,283) were pending. Of the applications approved, 269 (\$1,668,027) were approved for amounts less than applied for.

The following loans were approved from July 1, 1963, through September 30, 1963:

New England and Middle Atlantic Areas:  
Salvatore Passanisi, Somerville, Mass., \$40,000; William B. McConnell, Pleasantville, N. J., \$30,000; Samuel S. Cottle, Jr., Wakefield, R. I., \$10,000; and John C. Sisson, Wakefield, R. I., \$9,918.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the

Bureau) during the third quarter of 1963, 2 applications for \$72,327 were received and 2 applications for \$74,188 were approved. Since the program began (July 5, 1960), 30 applications were received for \$3,558,967. Of the total, 24 applications were approved for \$2,203,163 and 6 applications for \$1,318,304 were pending as of September 30 this year. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 10 (\$1,025,365) approved 8 (\$775,365);

California: Received and approved 1 (\$557,000);

South Atlantic and Gulf Area: Received 14 (\$509,056), approved 11 (\$400,752);

Pacific Northwest: Received 5 (\$1,467,546) approved 4 (\$507,546).

No applications for the Fishing Vessel Construction Differential Subsidy were received during the July-September quarter of 1963 as the authority to accept applications expired June 12, 1963. Since the beginning of the program on June 12, 1960, 13 applications were received for \$1,101,770, of which 6 applications were approved for \$546,103, and 7 applications for \$555,667 were pending.



### U. S. Foreign Trade

#### AIRBORNE IMPORTS OF FISHERY PRODUCTS, MAY 1963:

Airborne fishery imports into the United States in May 1963 were up 20.5 percent in quantity and 26.6 percent in value from those in the previous month. Total airborne imports in January-May 1963 were up 37.7 percent in quantity and 55.6 percent in value from those in the same period of 1962. The increase was due mainly to larger shipments of shrimp.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

Product and Origin <sup>2</sup>	U. S. 1/ Airborne Imports of Fishery Products, January-May 1963 with Comparative Data					
	1963		1963		1962	
	May	Value <sup>3</sup>	Jan.-May	Value <sup>3</sup>	Jan.-May	Value <sup>3</sup>
	Qty. <sup>1</sup>	Lbs.	Qty. <sup>1</sup>	Value <sup>3</sup>	Qty. <sup>1</sup>	Value <sup>3</sup>
Fish:		1,000	1,000	US\$	1,000	US\$
Mexico . . . . .	25.1	7.5	124.3	38.6	275.0	53.4
British Honduras . . . . .	3.3	1.0	33.9	8.6	-	-
Honduras . . . . .	-	-	15.3	4.0	-	-
Japan . . . . .	-	-	2.0	8.2	-	-
United Kingdom . . . . .	0.2	0.6	1.3	3.3	-	-
Iran . . . . .	-	1.3	7.4	-	-	-

(Table continued on next page)

U. S. <sup>1/</sup> Airborne Imports of Fishery Products, January-May 1963 with Comparative Data (Contd.)						
Product and Origin <sup>2/</sup>	1963		1963		1962	
	May	Jan.-May	May	Jan.-May	May	Jan.-May
	Qty./ <sup>3/</sup>	Value/ <sup>4/</sup>	Qty./ <sup>3/</sup>	Value/ <sup>4/</sup>	Qty./ <sup>3/</sup>	Value/ <sup>4/</sup>
France . . . . .	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
France . . . . .	0.3	0.3	0.7	0.6	0.2	0.5
Rumania . . . . .	-	-	-	-	1.3	11.3
Panama . . . . .	-	-	0.8	0.3	7.8	1.3
Ireland . . . . .	-	-	-	-	8.1	5.0
Canada . . . . .	-	-	-	-	-	-
Total Fish . . . . .	28.9	8.4	179.7	71.0	292.4	71.5
<b>Shrimp:</b>						
Guatemala . . . . .	15.6	8.2	117.1	62.1	98.1	52.3
El Salvador . . . . .	18.3	13.3	163.5	115.0	208.1	146.4
Honduras . . . . .	16.9	8.6	22.7	11.9	-	-
Nicaragua . . . . .	63.4	23.4	256.8	85.0	715.4	241.5
Costa Rica . . . . .	-	-	284.0	137.3	93.7	39.4
Panama . . . . .	115.8	63.2	723.5	389.6	457.9	230.4
Venezuela . . . . .	455.4	226.0	1,920.2	941.4	986.0	470.4
Ecuador . . . . .	21.9	9.6	94.3	32.7	12.2	3.5
France . . . . .	-	-	2.6	0.9	-	-
Mexico . . . . .	5.0	1.8	5.0	1.8	18.8	7.9
Netherlands Antilles . . . . .	-	-	-	-	3.1	2.7
Total Shrimp . . . . .	712.3	354.1	3,589.7	1,777.7	2,593.3	1,194.5
<b>Shellfish other than Shrimp:</b>						
Mexico . . . . .	2.1	1.1	73.0	42.6	27.8	16.1
British Honduras . . . . .	10.7	2.1	108.9	78.5	65.8	39.7
El Salvador . . . . .	-	-	5.0	3.6	-	-
Honduras . . . . .	0.3	0.2	1.9	1.0	60.2	47.7
Nicaragua . . . . .	23.5	11.4	71.3	49.3	0.4	0.3
Costa Rica . . . . .	-	-	73.8	60.1	1.4	1.3
Jamaica . . . . .	3.4	3.4	47.7	36.8	30.0	21.3
Netherlands Antilles . . . . .	3.7	2.6	32.8	20.9	14.2	9.3
Colombia . . . . .	3.5	11.3	6.4	15.8	1.3	3.2
Ecuador . . . . .	-	-	2.2	1.8	0.9	0.7
Tunisia . . . . .	0.3	0.3	0.8	0.9	-	-
Leeward and Windward Islands . . . . .	-	-	1.6	0.5	17.3	6.2
British Guiana . . . . .	-	-	1.7	0.3	-	-
Canada . . . . .	126.7	65.6	128.5	66.3	20.7	7.8
Venezuela . . . . .	-	-	13.7	6.0	22.3	13.6
Panama . . . . .	-	-	-	-	1.0	1.0
Guatemala . . . . .	-	-	-	-	7.4	3.9
Japan . . . . .	-	-	-	-	5/	0.3
France . . . . .	0.7	0.8	0.7	0.8	0.3	0.9
Dominican Republic . . . . .	-	-	6.2	5.0	-	-
Peru . . . . .	0.2	0.8	0.2	0.8	-	-
Total Shellfish (except shrimp) . . . . .	175.1	99.6	576.4	391.0	271.0	173.3
<b>Grand Total . . . . .</b>	<b>916.3</b>	<b>463.1</b>	<b>4,345.8</b>	<b>2,239.7</b>	<b>3,156.7</b>	<b>1,439.3</b>

<sup>1/</sup>Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.  
<sup>2/</sup>Where the country of origin is not known, the country of shipment is shown.  
<sup>3/</sup>gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.  
<sup>4/</sup>f.o.b. point of shipment. Does not include U. S. import duties, air freight, or insurance.  
<sup>5/</sup>Less than 50 pounds.  
 Notes: The figures included in the over-all import figures for total imports, i.e., these imports are not to be added to other import data published.  
 Source: *United States Airborne General Imports of Merchandise*, FT-380, May 1963, U. S. Bureau of the Census.

\* \* \* \* \*

## EDIBLE FISHERY PRODUCTS, AUGUST 1963:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in August 1963 were down 2.4 percent in quantity and 7.4 percent in value from those in the previous month. Imports were noticeably lower for canned tuna in brine, northern lobsters from Canada, and frozen shrimp. But there was a substantial increase in arrivals of groundfish fillets, blocks and slabs, and frozen tuna.

Compared with the same month in 1962, imports in August were down 8.8 percent in quantity, although the value

of the imports was the same in both months. This August there was a heavy cutback in imports of frozen tuna. The decline was offset partly by a large increase in imports of groundfish fillets and blocks and slabs, as well as higher imports of fresh swordfish, canned albacore tuna in brine, and frozen shrimp.

In the first 8 months of 1963, imports were down 5.9 percent in quantity and 2.2 percent in value. Fluctuations in individual import items were much greater than the overall totals indicate. Imports were down sharply in 1963 for canned tuna in brine, frozen tuna, canned sardines in oil, and canned salmon. On the other hand, there was a large increase in imports of canned sardines not-in-oil (mostly from South Africa Republic) and frozen shrimp, as well as heavier shipments of ocean perch fillets, blocks and slabs, fresh swordfish from Canada, canned crab meat from Japan, and frozen frog legs from India.

U. S. Imports and Exports of Edible Fishery Products, August 1963 with Comparisons						
Item	Quantity			Value		
	Aug. 1963	Jan.-Aug. 1962	Aug. 1963	Aug. 1962	Aug. 1963	Aug. 1962
<b>Imports:</b>						
<b>Fish &amp; Shellfish:</b>						
Fresh, froz. & processed 1/ . .	93.7	102.7	721.2	766.4	32.5	32.5
<b>Exports:</b>						
<b>Fish &amp; Shellfish:</b>						
Processed only 1/ (excluding fresh & frozen) . . .	1.6	1.7	20.0	21.2	0.9	0.9

<sup>1/</sup>Includes pastes, sauces, clam chowder and juice, and other specialties.

Exports of processed fish and shellfish from the United States in August 1963 were down 11.0 percent in quantity and 10.0 percent in value from those in the previous month. Lower shipments of canned salmon, canned shrimp, and canned squid offset a gain in exports of canned mackerel and canned sardines not in oil.

Compared with the same month in 1962, the exports in August 1963 were down 5.9 percent in quantity, although the value of the exports was the same in both months. Exports of canned salmon to the United Kingdom and canned sardines not in oil were down considerably this August.

Processed fish and shellfish exports in the first 8 months of 1963 were down 5.7 percent in quantity and the value dropped 3.4 percent from the same period in 1962. The drop in value was due to a general decline in the price of canned fishery products in 1963. The decline in quantity was due mainly to lower shipments of canned sardines and a drop in exports of canned mackerel to the Congo Republic. There were increases in exports of canned salmon, canned squid, and canned shrimp. Although not covered in the table, exports of frozen shrimp were up sharply in the first 8 months of 1963 (increase mostly in exports to Japan), and there was a substantial increase in exports of frozen salmon.

\* \* \* \* \*

## IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, AUGUST 1963:

United States imports of fish meal and scrap in August 1963 totaled 43,987 short tons, an increase of 55.7 percent from the 28,253 tons imported in August 1962.

About 90.6 percent of the fish meal and scrap imports in August 1963 entered through the Customs Districts of Maryland, Georgia,

Mobile (Ala.), Galveston (Tex.), Los Angeles (Calif.), San Francisco (Calif.), and Washington.

Customs Districts	August 1963
	Short Tons
Maine and New Hampshire	551
New York (N. Y.)	220
Massachusetts	160
Maryland	2,362
North Carolina	1,268
Georgia	6,510
Mobile (Ala.)	5,422
Galveston (Tex.)	1/4,084
Los Angeles (Calif.)	6,406
San Francisco (Calif.)	12,648
Washington	2,405
Dakota	385
Duluth (Minn.) and Superior (Wis.)	980
Michigan	503
Other Customs Districts	2/ 83
Total	43,987

1)Includes 1,161 tons of fish meal classified as fertilizer.

2)Includes 60 tons of fish meal classified as fertilizer.

Note: A list of the entry ports included within each Customs District is given in Schedule D, *Code Classification of United States Customs Districts and Ports*, which may be obtained free of charge by writing to the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C., 20233.

\* \* \* \* \*

## IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-August 31, 1963, amounted to 33,425,128 pounds (about 1,591,673 std. cases) according to data compiled by the Bureau of Customs. This was 10.3 percent less than the 37,272,804 pounds (about 1,774,895 std. cases) imported during January 1-September 1, 1962.

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1963 at the 12½-percent rate of duty is limited to 63,130,642 pounds (or about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota are dutiable at 25 percent ad valorem.



## Wholesale Prices

### EDIBLE FISH AND SHELLFISH, SEPTEMBER 1963:

Higher prices in September for most of the major fresh finfish items reversed the downward price trend of the previous three months in the wholesale price index for edible fishery products (fresh, frozen, and canned). The September 1963 index at 107.1 percent of the 1957-59 average was up

1.5 percent from the previous month. Compared with the same month a year earlier, prices this September were down 10.6 percent due to sharply lower prices for fresh and frozen shrimp and generally lower prices for all canned fish products.

The more significant price increases during September were in the subgroup for drawn, dressed, or whole finfish. From August to September the subgroup index rose 8.3 percent due to higher prices for ex-vessel large haddock at Boston (up 16.4 percent), and fresh dressed western halibut (up 13.0 percent) and king salmon (up 6.8 percent) at New York City. Supplies of fresh halibut from the seasonal North Pacific fishery were not as plentiful as in August, and the good demand for limited supplies of king salmon boosted prices upward. Prices this September also were higher for Lake Superior fresh whitefish at Chicago but dropped for Great Lakes yellow pike at New York City. Compared with the same month a year earlier, prices this September were higher for all items except salmon (down 5.7 percent). Lower salmon prices than in September 1962 cancelled out the sharp increase in fresh haddock prices which this September were up 26.1 percent from a year earlier and caused the subgroup index to rise only a nominal 0.5 percent.

The subgroup index for processed fresh fish and shellfish was down 0.2 percent from August to September despite substantially higher prices for fresh haddock fillets at Boston (up 14.6 percent) and some increase in fresh shrimp prices at New York City (up 1.5 percent). Lower prices for shucked standard oysters at Norfolk (down 3.1 percent) were responsible for the slight drop in the September subgroup index. As compared with the same month in 1962, the subgroup index this September was down 15.3 percent because of sharply reduced prices for fresh shrimp (down 33.7 percent).

Although most prices for processed frozen fish and shellfish were the same or slightly higher than in August, they were offset by a drop in prices for frozen shrimp at Chicago (down 3.2 percent). The subgroup index was down 1.5 percent from August to September and was below a year earlier by 20.7 percent because of lower frozen shrimp prices which were down about one-third from those in September 1962.

A slight drop of 0.2 percent from August to September in the price index for canned fishery products was caused by lower prices for canned Maine sardines which this September were lower by 1.8 percent. Prices for other canned products in the subgroup were unchanged from August. Compared with the same month a year earlier, the subgroup price index this September was down 8.0 percent due to lower prices for all canned fishery products. The disappearance of canned fish stocks this September was by no means marked but there was some indication of improvement and the beginning of a better market outlook for some items.



Frozen fish are unloaded into large boxes for holding in commercial frozen storage.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, September 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Sept. 1963	Aug. 1963	Sept. 1963	Aug. 1963	July 1963	Sept. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					107.1	105.5	110.0	119.8
Fresh & Frozen Fishery Products					110.6	108.0	114.3	125.6
Drawn, Dressed, or Whole Fish/Shellfish					125.6	116.0	110.0	125.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.11	98.5	84.6	83.4	78.1
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.44	.39	128.6	113.8	106.4	126.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.99	.93	138.0	129.2	122.3	146.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.68	.66	100.7	98.5	88.0	98.5
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.61	.64	99.9	104.8	100.7	91.7
Processed, Fresh (Fish & Shellfish)					104.3	104.5	120.8	123.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.43	.38	104.4	91.1	93.5	86.2
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.71	.70	83.2	82.0	106.7	125.4
Oysters, shucked, standards	Norfolk	gal.	7.75	8.00	130.7	134.9	143.3	126.5
Processed, Frozen (Fish & Shellfish)					97.4	98.9	107.9	122.8
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	100.1	98.9	100.1	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.36	.36	105.5	105.5	102.6	101.1
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.34	.33	117.5	115.7	116.6	110.4
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.76	.79	90.1	93.1	109.7	136.4
Canned Fishery Products					101.4	101.6	102.8	110.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.00	24.00	104.6	104.6	104.6	111.1
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.88	10.88	96.6	96.6	99.0	104.4
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.75	5.75	97.5	97.5	2/100.0	3/118.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	7.96	8.11	102.1	104.0	104.0	116.9

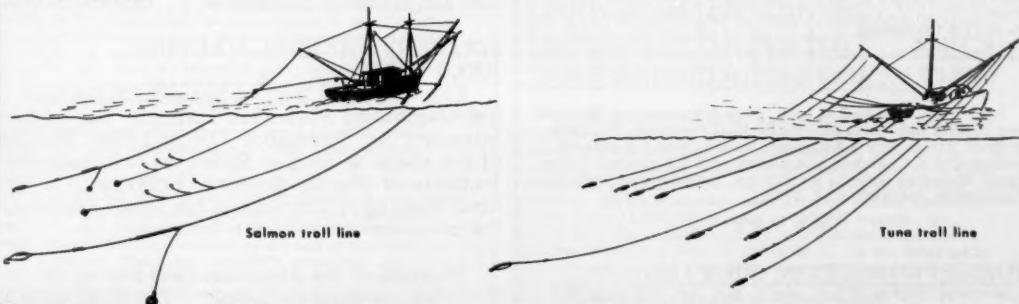
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/One commodity has been dropped in the fishery products index as of December 1962--"Sardines, Calif., tom, pack, No. 1 oval (15-oz.), 24 cans/cs."--and replaced by--"Mackerel, jack, Calif., No. 1 tall (15-oz.), 48 cans/cs." Under revised procedures by the Bureau of Labor Statistics all new products enter wholesale price indexes at 100.

3/Based on Calif. sardines and not directly comparable with replacement (jack mackerel) for January-September 1963.

### TROLL LINES

Troll lines are long single lines, with one or more barbed hooks at the free end of the line, baited with either a natural or an artificial lure, and drawn or towed behind a moving boat. They require constant attention. Troll lines are used principally in the salmon and tuna fisheries.



Note: Excerpt from Circular 109, *Commercial Fishing Gear of the United States*, for sale from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402, single copy, 40 cents.



## International

### FISH MEAL

#### PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-JUNE 1963:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Exports of fish meal by FEO countries during January-June 1963 were up 3.0 percent while their total production was up 21.3 percent from that in the same period of the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-June 1963

Country	May		June		Jan.-June	
	1963	1962	1963	1962	1963	1962
.....(1,000 Metric Tons).....						
Angola .....	2.4	1.5	2.3	2.2	13.9	14.9
Iceland .....	7.2	8.1	3.2	7.2	37.2	38.4
Norway .....	7.4	1.5	5.6	1.6	41.6	23.1
Peru .....	78.1	97.9	84.6	96.9	614.1	559.9
So. Africa (including S. W. Africa) .....	14.1	23.7	16.1	18.8	72.4	120.0
Total .....	109.2	132.7	111.8	126.7	779.2	756.3

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-June 1963

Country	May		June		Jan.-June	
	1963	1962	1963	1962	1963	1962
.....(1,000 Metric Tons).....						
Angola .....	2.3	1.5	2.3	2.5	13.0	14.4
Iceland .....	4.6	9.7	4.8	5.4	39.6	32.4
Norway .....	10.6	3.8	19.5	10.7	44.5	30.6
Peru .....	160.2	121.5	98.7	83.8	701.7	544.4
So. Africa (including S. W. Africa) .....	33.2	32.0	32.2	23.6	146.9	157.6
Total .....	210.9	168.5	157.5	126.0	945.7	779.4

During the first half of 1963, Peru accounted for 78.8 percent of total fish-meal exports by FEO countries, followed by South Africa with 9.3 percent, Norway with 5.3 percent, Iceland with 4.8 percent, and Angola with 1.8 percent. (Regional Fisheries Attaché for Europe, United States Embassy, Copenhagen, September 18, 1963.)

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#### WORLD PRODUCTION, JULY 1963:

World production of fish meal in July 1963 was down 27.3 percent from that in the same month of 1962, according to preliminary data from the International Association of Fish

Meal Manufacturers. The decline was due mainly to lower production in Peru, the United States, Iceland, and Norway.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	World Fish Meal Production by Countries, July 1963			
	July		Jan.-July	
	1963	1962	1963	1962
.....(Metric Tons).....				
Canada .....	5,335	5,914	43,245	49,193
Denmark .....	11,497	11,700	58,941	50,570
France .....	1,100	1,100	7,700	7,700
German Federal Rep. ....	5,632	7,196	44,581	43,317
Netherlands .....	1/	500	2/ 1,900	2,900
Spain .....	1/	2,117	3/ 10,869	15,829
Sweden .....	224	10	3,331	2,506
United Kingdom .....	7,250	7,287	46,098	44,935
United States .....	34,424	50,436	4/ 116,198	4/ 160,947
Angola .....	1,078	1,190	4/ 14,540	15,558
Iceland .....	6,316	19,094	4/ 45,884	51,424
Norway .....	25,255	36,494	69,743	67,178
Peru .....	39,240	65,716	740,747	610,158
So. Afr. (incl. SW Afr.) .....	30,487	22,120	178,484	180,316
Total .....	167,838	230,874	1,382,262	1,302,531

1/ Data not available.

2/ Data available only for January-June.

3/ Data available only for January-May.

4/ Revised.

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production during the first 7 months of 1963 was 6.1 percent greater than in the same period of the previous year. Production in 1963 was boosted by heavier landings of anchoveta in Peru. But there was a sharp decline in production in the United States.

Peru accounted for 53.6 percent of total fish meal production during January-July 1963, followed by South Africa with 12.9 percent and the United States with 8.4 percent.

#### GULF AND CARIBBEAN COMMISSION

#### SIXTEENTH ANNUAL MEETING HELD IN MIAMI:

The Sixteenth Annual Session of the Gulf and Caribbean Fisheries Institute was held in Miami, Fla., November 11-15, 1963. The site of the meeting on Key Biscayne was near the Institute of Marine Science, University of Miami, making it convenient for those attending the meetings to visit the Institute.

Themes of the sessions held during the five-day meeting included: "The Challenge to U. S. Fisheries," "Shrimp Research Results," "Seafood and Public Health," "Current Fish-

**International (Contd.):**

"Caribbean Research," and "The Future for Caribbean Fisheries."

Other organizations which met concurrently with the Gulf and Caribbean Fisheries Institute were the Southeastern Fisheries Association and the National Shrimp Congress.

**INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS****FOURTH ANNUAL CONFERENCE HELD IN PERU:**

The Fourth Annual Conference of the International Association of Fish Meal Manufacturers was scheduled to be held Oct. 28-31, 1963, in Lima, Peru. The Conference was to coincide with the holding in Lima of the 3rd International Fair of the Pacific.

The Peruvian fish meal industry, represented by the Sociedad Nacional de Pesqueria, was host to the Conference.

Over 100 delegates and observers from almost all the fish meal producing countries in the world, covering North and South America, Europe, Africa, and Asia, were expected to attend. The fact that some 60 of those were from countries outside South America emphasizes both the importance of and interest in the Peruvian fish meal industry, the largest in the world, and the importance which members attach to the International Association's Annual Conference. Facilities were provided for visits to the Peruvian fish meal and fishing industries.

The delegates and observers attending represent the leading manufacturers and scientists in the industry. Those attending from outside South America met a large Peruvian delegation as well as many observers from Chile. Representatives from Mexico and the Argentine were invited. Denmark, Germany, Norway, South Africa, Great Britain, and the United States sent large delegations. Delegations were expected to attend from Canada, France, Iceland, the Netherlands, Portugal, Spain, and Sweden. Japan was expected to send observers, and plus official observers from the Food and Agriculture Organization (FAO) of the United Nations, probably from UNICEF, from CORFO in Chile, and from the Fishmeal Exporters Organization (FEO).

The International Association (which was formed in 1959) is the recognized international body representing the world fish meal industry and as such provides a valuable forum for discussions between producers, many of whom are also major exporters or whose countries are major importers as well as producers, concerning the many commercial, promotional, scientific, and technical problems affecting the industry. In this way, while the Association is not concerned with matters relating to price or actual marketing, it helps all producers to ensure a regular well marketed supply of high-quality fish meal, so essential in modern animal nutrition. It is also concerned with the expansion of markets in both developed and underdeveloped countries.

Specific problems which have received attention during the year and which were considered at the Conference included an economic survey of the industry to help ensure steady supplies to consumers and a fair and economic return to producers without unnecessary market fluctuations; a summary of promotional activities in various countries to see how these can be adopted in newer and expanding markets; and further publications on the use of fish meal in animal nutrition. The many scientific questions considered included analytical methods and quality standards where the Association is closely collaborating with a number of national and international bodies; fish flour for human consumption (fish protein concentrate), which is now arousing ever widening interest; and problems of international

feedstuffs regulations. These regulations involve liaison with the European Economic Community (EEC), and other European bodies.

The Association actively collaborates and exchanges information with FAO, WHO, and UNICEF, on a wide range of topics, and is interested particularly in the Freedom from Hunger Campaign and the development of fish protein concentrate. It also collaborates with the European Federation for Animal Technology (FEZ), various official committees in the United States and the EEC, and with the Fishmeal Exporters Organization in the activities of FEO that relate to marketing promotion, exchange of statistics, and similar matters.

**INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA****DEPOSIT OF INSTRUMENT OF ACCEPTANCE BY PARAGUAY:**

The Instrument of Acceptance by the Government of the Republic of Paraguay of the International Convention for the Safety of Life at Sea, 1960, was deposited with the International Maritime Consultative Organization on September 11, 1963. As of that date, the States which had accepted the Convention were as follows: Haiti, Norway, France, Republic of Viet-Nam, Ghana, Peru, United States, Madagascar, Morocco, Spain, Greece, Japan, Tunisia, Cuba, and Paraguay. (United States Embassy, London, September 20, 1963.)

**NORTH PACIFIC FISHERIES CONVENTION****INTERNATIONAL FISHERIES CONSERVATION EFFORT URGED BY PRESIDENT:**

President Kennedy called for increased international cooperation in the conservation of fisheries resources in a strong statement issued on September 10, 1963, in which he expressed his support for the abstention principle. The full text of the President's statement, which was issued in conjunction with the opening of the North Pacific Treaty discussions in Tokyo on September 16 follows:

"Ambassador Benjamin A. Smith II will lead a delegation being sent to Japan to discuss with Japan and Canada international arrangements for the conservation and use of fishing resources in the North Pacific Ocean. The discussions, which are scheduled to begin on September 16, represent the second attempt to reach agreement on the questions raised by Japan about the restrictions upon its rights under an existing convention relating to fishing in the North Pacific. The first attempt was made last June.

"The abstention principle, which calls for the fishing restrictions when certain criteria occur, will be the central issue in the new discussions. I believe this principle is sound and reasonable. Without restraints of this nature the nations of the world would run serious risks of depleting fisheries. We have already seen Atlantic halibut fisheries decline from 13,500,000 pounds to 300,000 pounds. In Bristol Bay, the record catch of 24.7 million salmon in 1938 has fallen to a level of 2.8 million. On the other hand, research and careful regulation have restored depleted Pacific halibut fisheries from a low of 40 million pounds in 1923 to an annual average of 70 million pounds.

"It is obvious that unless international conservation agreements are strictly enforced there is grave danger of

**International (Contd.):**

permanent injury to our ocean resources. I hope that it is possible to implement Senate Resolution 392, which called for an international fishery conference so that such damage can be avoided.

"In dealing with the North Pacific fisheries problems we shall be mindful of our responsibility for the preservation of vital fishing resources. When the Convention criteria called for the removal of Bering Sea halibut from abstention, this was done despite the disadvantage to American fishermen. We shall hope for the same understanding from other nations--to retain the abstention principle when appropriate--for only in this way will it be possible to reach agreement in the common world interest."

Senate Resolution 392, to which the President referred in his statement, was passed by the Senate on September 20, 1962. It calls for the convening of "an International Conference on the Conservation of Fishery Resources to consider the technical, economic, and scientific problems relating to the conservation, utilization, and regulation of living marine resources in the high seas and estuarine waters of the world," and the encouragement of "government, industrial, scientific, and technical participation in such Conference on as wide a basis as may be practicable. . ."

\* \* \* \* \*

**CONFERENCE RECONVENES IN TOKYO:**

On September 16, 1963, the Second Meeting of the Parties to the International Convention for the High Seas Fisheries of the North Pacific Ocean opened in Tokyo, Japan. The meeting between delegates of the United States, Canada, and Japan is a continuation of an earlier meeting held in Washington, D. C., in June 1963, and is primarily concerned with establishing the understandings necessary for the drafting of a new treaty to cover the salmon and halibut fisheries of the North Pacific.

Immediately after the opening session, it was apparent that the fundamental difference between the positions of the United States and Japan on the principal of "abstention," which had ended the June meeting in deadlock, remained substantially unchanged. As a result, the proceedings moved at a slow pace. (United States Embassy, Tokyo, September 20, 1963.)

Note: See *Commercial Fisheries Review*, October 1963 p. 43.

**Angola****FISHERIES TRENDS, SEPTEMBER 1963:**

The Naval Commandant and Director of the Merchant Marine Commodore in Angola has announced plans to create an "Escola Profissional de Pesca" and a "Casa dos Pescadores." At the same time it was announced that a group of South African busi-

nessmen were planning to visit Luanda to discuss the further development of the spiny lobster fishery. (United States Consul, Luanda, September 26, 1963.)

**Argentina****LANDINGS BY OFFSHORE FISHING FLEET HIGHER IN 1962:**

In 1962 Argentina's commercial fisheries landings amounted to 92,326 metric tons (about 204 million pounds), an increase of 1.8 percent over the 1961 landings, but 7.7 percent under the record 1960 landings of 99,984 tons. It is believed that the total 1963 fisheries landings will be about 110,000 tons.

There is considerable public and official interest in exploiting Argentina's rich ocean-fisheries resources, developing the present rather small fishing industry and expanding foreign markets. In order to exploit these resources the Argentine Government has prepared a request to the Special Fund of the United Nations for assistance in a US\$5 million 5-year plan for the study of its ocean fisheries and development of its ocean-fishing industry. This will be the early stage of planning for an ambitious \$25-30 million fishing-industry development program. In March 1962, the Argentine Government issued two decrees aimed at stimulating the local fishing industry by means of customs and taxation benefits and government credits.

The use of the 1962 commercial fisheries landings for freezing, salting, canning, fish meal, and fish oil rose to 46,082 metric tons, a 17-percent increase over 1961, while fresh fish consumption declined to 45,939 tons. Exports of fish and fish products rose to 2,532 tons, valued at \$394,395, and imports slipped slightly to 2,560 tons, valued at \$1,022,014.

The convergence of the Antarctic Malvinas Current with the Equatorial Brazilian Current in an extensive continental shelf area off the Argentine coast between parallels 38° and 44° degrees south latitude results in extremely favorable conditions for deep sea trawlers. International fisheries experts estimate the annual possible yield of those waters at 3-3.5 million tons of fish per year, the preponderance of which would be fine species with high world market values.

The deep-sea landings of 1962 represented slightly over one-half the entire ocean landings

## Argentina (Contd.):

for the year--only a fractional increase over 1961--but it was the first year that the deep-sea landings exceeded the coastal landings. The increase in the deep-sea landings is expected to continue with the addition of modern vessels in 1963. The relative stagnation of coastal fishing is expected to continue.

The Atlantic coast resort city of Mar del Plata is the center of the Argentine fishing industry and in 1962 accounted for 72 percent of all of Argentina's ocean-fish landings. Mar del Plata is the home port for Argentina's 37 deep-sea fishing vessels, which landed 40,941 metric tons of fish in 1962, and also the home port for 204 old coastal vessels which landed 30,981 tons of the 40,919 tons landed by the entire Argentine coastal fleet of 400 vessels. There are an estimated 3,000 fishermen, mainly of Italian origin, at Mar del Plata.

The "merluzza," similar to United States east coast whiting, accounted for 46 percent of the total ocean landings in 1962 as compared to 44 percent the previous year. The landings of miscellaneous species of fish was second to "merluzza," displacing both the small anchovy and mackerel, the miscellaneous species largely being used for fish-meal production.

Shad (sabalo) composed 68 percent of the total landings of fresh-water fish in 1962, a year in which the fresh-water landings slumped considerably from 1961 and 1960. (United States Embassy, Buenos Aires, September 14, 1963.)



## Australia

## JAPANESE BUYING AUSTRALIAN SHRIMP:

The Japanese are outbidding United States importers for Australian frozen king shrimp. Also, the Japanese are attempting to tie-up the Australian production for the next three years, reports the July 1963 issue of (Australian) *Fish Trades Gazette*. Up to 9s. or US\$1.01 a pound f.o.b. has been paid for frozen king shrimp tails by the Japanese, and it is believed they have offered as much as 11s. or \$1.23 a pound f.o.b. These prices are reported to be higher than those offered by United States buyers.

Apart from the higher price, Australians say that the big advantage of dealing with Japan is that exporters are paid when the shrimp are delivered to the ship in Australia. With the United States buyers, shrimp are sent on a consignment basis and exporters carry the risks as well as waiting longer for their money.

This season, Japan is likely to get the entire export pack of Australian king shrimp.

Japan's interest in Australian shrimp has given a spurt to the exploitation of new grounds in Western Australia and the Gulf of Carpentaria.

In Western Australia the industry is being geared to supply Japan with a firm order, worth A\$1,340,000 (\$3 million), while the Queensland Government is helping to speed up the development of new grounds in the Gulf of Carpentaria.

In Queensland, late in June 1963, the first commercial fishing expedition to the Gulf of Carpentaria left Bundaberg accompanied by a Government survey party.

The expedition consisted of 8 trawlers which will later be joined by a freezer boat. It was organized and financed by a well-known Sydney firm. The fleet will operate out of Karrumba where shore installations have been set up and shrimp will be transported to Cairns or Townsville.

The shrimp fleet is likely to move south during the "wet" season from December onwards.

A Western Australian firm in July 1963 said it had firm orders from Japan for shrimp. The first order of shrimp for Japan was processed by the firm at Geraldton. The shrimp were caught outside the Shark Bay area but landed at that point and transported to Geraldton for processing. The firm was converting 4 spiny lobster freezer boats, fitted with new types of winches and nets, at a cost of A\$3,000 (\$6,700) each for deep-water shrimp fishing in the Exmouth Gulf area. A shrimp expert from the eastern States would supervise the initial stages of shrimp fishing in that area. The same company had been working with the Western Australia Fisheries Department and the Department of Industrial Development on plans to develop shrimp fishing north of Shark Bay.

Another firm intends to bring a 126-foot supply and research ship, *Kwinana Empress* from the eastern States to work with the catching boat north of Shark Bay. The same company also has orders for shrimp from America.

Fremantle Fishermen's Co-operative Society Ltd. had orders for shrimp from Italy. Also, a trial shipment of spiny lobster tails sent this year had been well received and prospects looked good for next season. (*Australian Fish Trades Review*, July 1963.)

\* \* \* \* \*

## SPINY LOBSTER FISHERY REGULATIONS FOR WESTERN AUSTRALIA AMENDED:

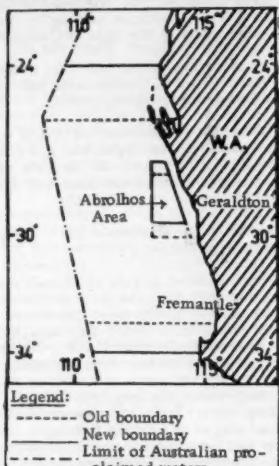
Following investigations in the spiny lobster or crayfishing centers in Western Australia by the Fishermen's Advisory Committee, the Western Australian Government has approved changes in the regulations governing closed seasons, and the areas to be affected by those seasons, for spiny lobster in State waters.

The new regulations will eliminate the previous division of areas by the 30° S. latitude. The closed season formerly began on August 31 in the area south of 30° S. and on August 15 in the area north of 30° S. latitude.

There is now a single closed season between August 15 and November 14 each year in the waters bounded by 24° S. and 34° S. This area differs from the area previously

## Australia (Contd.):

subject to closed seasons, which was bounded by  $26^{\circ}$  S. and  $33^{\circ}$  S.



The map outlines the new areas affected by closed seasons (shown by solid line) compared with the old areas (dotted line).

As previously, separate regulations will apply to the Abrolhos area. This area has been redefined by moving the southern and northern boundaries northward by 30 minutes of latitude. The eastern and western boundaries will continue to follow the same lines as before, but will extend northward from  $27^{\circ}30' S.$  to  $29^{\circ}30' S.$ , instead of  $28^{\circ} S.$  to  $30^{\circ} S.$  as previously.

The date on which the closed season in the Abrolhos will begin will now be uniform with the date applied outside the Abrolhos, or August 15. The Abrolhos closed season will terminate on March 14 instead of (as previously) the last day of February.

Notices under the Commonwealth Fisheries Act 1952-1959 will be issued to complement the State regulations in the area of proclaimed waters adjacent to those affected by the State regulations. (Fisheries Newsletter, September 1963.)

\* \* \* \* \*

#### TUNA FISHERY TRENDS IN SOUTH AUSTRALIA, 1963

A record 3,966 short tons of tuna were landed during South Australia's 1963 tuna

season which ended in June, but production was well below the anticipated 5,000 tons. Although the tuna fleet increased in 1963, the average catch per vessel was 16 percent below that in the previous year.

Good catches were taken at the start of the 1963 season, and by the end of February, landings had reached 1,931 tons--almost double the production during the corresponding period in 1962--but catches were down sharply in April and May. Toward the end of the season, tuna were scattered and hard to hold at the surface. The weather was also poor.

Southern Australia Tuna Landings, 1958-1963		
Year	No. of Vessels Participating	Landings (Short Tons)
1963 . . . . .	23	3,966
1962 . . . . .	18	3,710
1961 . . . . .	12	2,481
1960 . . . . .	8	1,536
1959 . . . . .	4	770
1958 . . . . .	3	593

A disappointing tuna season from the point of view of most vessel owners has raised doubt as to the long-term potential of the fishery. At present, the fishery is not subject to any control, and because the industry has enjoyed a boom period over the last few years, the tuna fleet has rapidly expanded. The total vessel capacity of the 1963 fleet was assessed at about 900 tons.

Vessels have been operating on immature fish, but it may be possible with the introduction of new fishing techniques to exploit adult stocks and as a result to greatly increase landings. However, a change from the pole-and-line method to any other technique would involve considerable cost to the fisherman.

(Fisheries Newsletter, Australia, August 1963.)

\* \* \* \* \*

#### WHALING STATION AT CARNARVON CLOSES

The Australian whaling station at Carnarvon, Western Australia, ceased operations on August 9, 1963. This left only one active Australian whaling station located at Albany, Western Australia.

The Carnarvon station began baleen whaling on July 6 and up to August 9 this year had taken 68 humpbacks, 3 sei, and one blue whale. To the same date (from June 6) it had taken 24 sperm whales.

The Albany station began baleen whaling on June 13 and up to August 10 had taken 19 humpbacks. To the same date (from March

## Australia (Contd.):

10) it had taken 298 sperm whales. (Fisheries Newsletter, Australia, September 1963.)



## Brazil

## FISHERIES DEVELOPMENT:

With the joint aims of providing additional protein for the Brazilian people and creating new export possibilities, an advisory group has proposed to the Brazilian Ministry of Agriculture a series of measures which are to form the basis for a national policy on fisheries development. Strongly recommended were measures for increasing the yield of coastal and river fisheries; establishing a fish-processing industry in northeast Brazil; and developing tuna, lobster, and shrimp fishing and processing for the internal market and for export. The advisory group also proposed building an offshore fishing fleet over the next 3 years composed of 82 large fishing vessels, 255 medium vessels, and 1,000 vessels in smaller categories.

Offshore and river fishery stocks are a potentially rich but basically undeveloped Brazilian natural resource. The Superintendencia do Desenvolvimento da Pesca (SUDEPE), responsible for administering the development program, will face practical problems in reeducating and coordinating the diverse elements of the traditional Brazilian fishing industry. Providing funds for the program may also be a problem. (United States Embassy, Rio de Janeiro, September 11, 1963.)



## Burma

## MARKET FOR CANNED SARDINES AND MACKEREL:

During fiscal year 1961/62, Burma imported 8.2 million pounds of canned fish. Of that total, 98.8 percent was supplied by the South Africa Republic. (The United States supplied only 500 pounds.) However, since November 1962, all imports from South Africa have been banned as Burma's contribution to the Afro-Asian boycott due to South African racial policies. Japan has replaced South Africa as the primary supplier of canned fish.

Canned fish is a controlled item in Burma and the Government Civil Stores Committee No. 2 is solely responsible for the import and distribution. Canned fish in tomato sauce and canned fish in oil (sardines and saury packed in oval and tall tins) are popular in Burma. Other types of canned fish are imported in small quantity by hotels and restaurants. (United States Embassy, Rangoon, September 16, 1963.)



## Canada

## BRANDING IRONS USED TO MARK LARGE FISH IN MIGRATION STUDIES:

As a result of the growing interest in the mackerel shark fishery off Nova Scotia, the Fisheries Research Board of Canada has started a study of shark migrations, since only limited information is available on their movements.



Fig. 1 - Branding irons used to mark sharks. The larger iron at the right has the letters FRB (Fisheries Research Board). Any combination of numbers is possible since each figure is on a separate iron.

In fish migration studies, marking is usually done by clipping off various combinations of fins, or by attaching some kind of tag to the fish. Many of the tags used on large fish are of the dart type, that is, they are held in place by a barb in the flesh, while identifying data are carried in a suspended tube or on a plastic dangler. On large fish, dart tags are relatively small.

Since many sharks are cut clear of fishing gear without being boated, it is important that they be marked conspicuously enough to attract attention in the water alongside the vessel. Scars on the back or sides of large fish are easily seen, so a branding technique was

## Canada (Contd.):

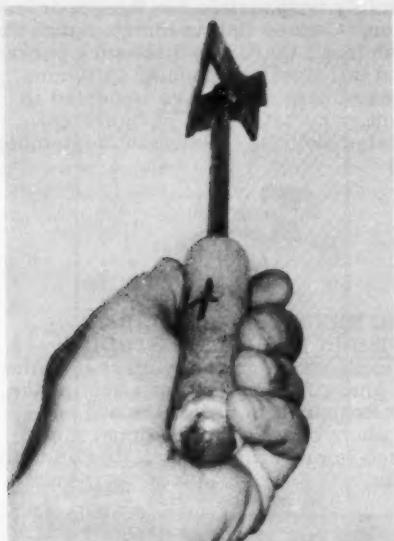


Fig. 2 - Individual branding iron.

devised by the St. Andrews (New Brunswick) Biological Station of the Fisheries Research Board. Branding irons were heated in a gasoline stove and used to mark fish with bold letters about  $1\frac{1}{2}$  inches high and  $\frac{1}{8}$  inch deep. During 1962, a total of 23 sharks were marked in that manner, and one of the branded sharks was recovered. That fish was marked with both a tag and a brand at Corsair Canyon on southeast Georges Bank and recaptured at Hydrographer Canyon about 150 miles to the southwest a month later. (Canadian Department of Fisheries, January 4, 1963.)



## Chile

FISHERIES DEVELOPMENT INSTITUTE TO BE ESTABLISHED:

The Government of Chile and the United Nations Special Fund on August 31, 1963, signed an agreement covering the Plan of Operation for the establishment of a Fisheries Development Institute. The purpose of the project is to provide through a permanent Fisheries Development Institute the technical basis for the accelerated development and rational exploitation and utilization of Chile's fisheries resources. The project,

which originated with the Chilean Government's request in 1960 for technical assistance in the investigation and development of its fisheries resources, will be developed over a 5-year period at an estimated cost of US\$4,958,300. The United Nations Special Fund will contribute US\$1,327,550 toward the financing, and the Government of Chile the equivalent of \$3,630,750. The headquarters of the Fisheries Development Institute and its principal laboratory will be in Santiago. The Institute is to be a legal autonomous entity.

To achieve its purpose, the Fisheries Development Institute will undertake the following program:

(1) To study the nature, distribution, and density of marine resources in Chilean waters, as well as the effects of fishing on stocks presently being exploited; and to conduct related oceanographic work.

(2) To improve fishing methods, vessels, and gear (with special emphasis on small-craft fishermen), through experiments and demonstrations.

(3) To study the marketing of fishery products with particular reference to problems of handling, transportation, and distribution in national and foreign markets.

(4) To draw up quality standards and establish quality controls for fishery products; to train personnel in quality grading; and to establish an inspection service. To assist fishery processing plants to improve products through better handling of fresh fish, better selection of raw material, better packing, and improved factory efficiency.

(5) To raise standards of technical skills of fishermen, processors, research workers, and other persons associated with the fisheries industry by improving the fisheries studies offered by universities and technical schools. To encourage fishery cooperatives.

(6) To improve statistical information in the fishing industry for use in economic and biological studies.

Where appropriate, the studies of the Fisheries Development Institute will be carried out in coordination with the Chilean Ministry of Agriculture, the Chilean Development Corporation (CORFO), universities, and other appropriate agencies. The Institute also will work in collaboration with the Marine Resources Research Institute in Peru, and the National Fisheries Institute in Ecuador, and will collaborate in the work of the Permanent Commission for the Conservation and Explo-

**Chile (Contd.):**

tation of the Marine Resources of the South Pacific.

The Food and Agriculture Organization of the United Nations will act as executive agency for the Special Fund which will provide the Project Manager of the Fisheries Development Institute and other experts and consultants required to carry out the approved work program. An administrative council will be appointed by the Government of Chile to guide the work of the Institute.

The Fisheries Development Institute is intended to be a continuing permanent institution operating as an autonomous body. At the conclusion of the 5-year development project, the United Nations Special Fund will transfer the title of its equipment in the Institute to the Government of Chile. (United States Embassy, Santiago, September 25, 1963.)

\* \* \* \* \*

**PERMITS REQUIRED FOR FOREIGN VESSELS FISHING WITHIN 200-MILE ZONE:**

By Decree 453 of July 18, 1963, the Government of Chile limits operations of mothership or factoryship fishing vessels in Chilean waters to the southern zone below the 37° S. latitude (off Coronel, or about 19 miles south of Concepcion).

The Decree provides:

(1) That only the Ministry of Agriculture may issue fishing permits for motherships or factoryships to operate within the 200-mile zone of Chile's territorial waters.

(2) That requests for fishing permits for factoryships be accompanied by information as to the nature of fishing operations to be carried out, quantity of fish to be taken, length of time and location in the zone the factoryship expects to operate, date the ship desires to begin operation, actual period for the operations, port of discharge for products processed by the ship, and port where the Chilean inspector should board the factoryship to assess charges on its take.

(3) That no permit may be granted for factoryships to operate within the 200-mile zone of territorial waters from the northern limit of Chile south to the 37° parallel.

This decree, like Decree 332, is intended to tighten the Government's control over the activities of foreign fishing vessels in the 200-mile zone claimed by Chile as its territorial waters. Strict application of the restrictions placed on operations of foreign vessels may encourage foreign capital to establish fish-processing plants within Chile particularly in view of the concessions and tax privileges available under the Fisheries Law to companies engaged in all phases of the fishing industry. (United States Embassy, Santiago, September 13, 1963.)

\* \* \* \* \*

**JAPANESE FIRM TO PARTICIPATE IN SURVEY OF FISHERY RESOURCES:**

At the request of Chilean fishery authorities, a Japanese fishery company is planning to assist Chile in a survey of Chilean waters. One of the main purposes of the survey is to determine the extent of king crab and hake resources off Chile. Research vessels are expected to be furnished by Chile. (Shin Suisan Shimbun Sokuho, September 12, 1963.)

**Denmark****LOWER SIZE LIMIT FOR NORWAY LOBSTERS DISCUSSED:**

Norway lobsters are caught by Danish fishermen mostly in the northerly part of the Kattegat. They are exported frozen as Danish "baby lobster tails" to the United States (678,000 pounds valued at US\$951,000 in 1962). In early September 1963, the Danish Fisheries Association was determining whether a majority of north Jutland fishermen wished to request the Ministry of Fisheries to lower the minimum size from 15 centimeters (5.91 inches) to 13 centimeters (5.12 inches), the lower limit for Norway lobsters taken by Swedish and Norwegian fishermen. (Regional Fisheries Attaché for Europe, U. S. Embassy, Copenhagen, September 11, 1963.)

**El Salvador****INCREASE IN DUTY ON CANNED MACKEREL PROPOSED:**

As of early September 1963, it was probable that the Salvadoran duty on canned mackerel

## El Salvador (Contd.):

would be raised from its preferential rate of US\$5 per 100 kilograms (about 2.268 U. S. cents a pound). The new rate has not been announced but may be near \$35 per 100 kilograms (about 15.876 U. S. cents a pound).

It is believed that canned mackerel is one of the items whose tariff equalization for the Central American Common Market was agreed upon at the technical level at a meeting held at Tegucigalpa, Honduras. The meeting of the Executive Council which was scheduled for August 29 in San Salvador to consider the recommendations of the Tegucigalpa meeting was postponed and was held later in Guatemala. Apparently the recommendations of the technicians were being closely held until they were considered by the Executive Council.

According to an official in the Salvadoran Ministry of Economy, the other countries of the Central American Common Market have already leveled their duty on canned mackerel at a higher rate than that prevailing in El Salvador, and are asking El Salvador to agree to the higher level.

Another official of the Ministry of Economy and one of the members of El Salvador's delegation to the Tegucigalpa meeting stated that although he could not remember the exact figures he knew that the Salvadoran delegation, despite instructions to the contrary, had agreed to higher figures set by the other countries. (United States Embassy, San Salvador, September 6, 1963.)



## Faroe Islands

FISHING INDUSTRY TRENDS,  
1952-1962, AND OUTLOOK:

**Summary:** The Faroe Islands, a partly self-governing community within the Danish State, are located in the Atlantic Ocean about 800 miles northwest of Denmark. The Islands' population of 35,000 is almost wholly dependent on fishing. The record Faroese fisheries catch of 143,520 metric tons taken in 1962, mainly cod, came in large part from West Greenland waters with smaller quantities from local Faroese grounds, the Barents Sea, and waters off Iceland and Newfoundland. The herring catch was taken mainly in the

Norwegian Sea. Faroese trawlers as well as long-line and hand-line vessels take demersal fish, while gill-net and purse-seine vessels catch herring. About 6,900 fishermen are engaged in the industry with a declining number employed on foreign vessels. About three-fourths of the Faroese catch is processed into wet- and dry-salted fish and salted herring. Other products are iced and frozen fish. The production of canned fish and fish meal and oil is negligible. The most important exports are dry- and wet-salted fish to Southern European countries and Brazil; iced fish to the United Kingdom; salted herring to European countries; and frozen fish fillets to the United States.

Table 1 - Fisheries Catch by Faroese Vessels, 1952-1962

Year	Demersal Species <sup>1</sup>	Herring	Total	(Metric Tons <sup>2</sup> )
				143,520
1962	133,665	9,855	143,520	
1961	103,193	16,885	120,078	
1960	98,011	11,417	109,428	
1959	73,505	13,695	87,200	
1958	89,069	17,671	106,740	
1957	88,550	17,034	105,584	
1956	92,648	23,668	116,316	
1955	92,503	13,116	105,619	
1954	61,828	27,606	89,434	
1953	71,694	17,062	88,756	
1952	83,298	3,885	87,183	
10 yr. average (1953-62)	90,467	16,801	107,268	

<sup>1</sup>Includes cod, haddock, halibut, ling, plaice, saithe, tusk, porbeagle, Norway lobster, redfish, and catfish.

<sup>2</sup>Round fresh weight.

Note: Includes landings in foreign ports.

**Fisheries Landings:** The record Faroese fisheries landings in 1962 were 19 percent greater than in 1961, the previous record year, and 48 percent over the 10-year average during 1953-1962. Demersal fish--cod, haddock, halibut, ling, plaice, saithe, tusk, porbeagle, Norway lobster, ocean perch, and catfish--made up 93 percent of the catch in 1962. The increase in the 1962 landings was due to a gain in the cod catch which more

Table 2 - Catch of Herring by Faroese Vessels, by Fishing Grounds, 1952-1962

Year	Fishing Grounds			(Metric Tons <sup>1</sup> )
	Faroese	Norwegian Sea	North Sea	
1962	175	9,680	-	9,855
1961	10	16,875	-	16,885
1960	445	10,972	-	11,417
1959	690	13,005	-	13,695
1958	1,917	15,771	-	17,688
1957	788	16,246	-	17,034
1956	703	22,966	-	23,669
1955	175	12,940	-	13,116
1954	182	27,424	-	27,606
1953	220	16,152	690	17,062
1952	-	3,885	-	3,885

<sup>1</sup>Round fresh weight.

## Faroe Islands (Contd.):

Species	Fishing Grounds								Total
	Iceland	Faroese	Barents Sea	Newfoundland	West Greenland	East Greenland	North Sea	(Metric Tons <sup>1/</sup> )	
Cod	8,657	6,751	3,109	5,051	92,699	-	-	-	116,267
Haddock	919	7,041	83	6	13	-	-	-	8,062
Halibut	80	137	11	-	1	-	-	-	229
Ling	415	450	-	-	51	-	-	-	916
Plaice	84	26	-	-	-	-	-	-	110
Saithe	590	2,494	2	77	31	-	-	-	3,194
Tusk	614	1,902	6	1	362	-	-	-	2,885
Porbeagle	-	-	-	797	-	-	-	-	797
Norway lobster	-	-	-	-	204	-	-	-	204
Ocean perch	-	-	-	-	-	-	-	-	-
Catfish	-	-	-	-	-	-	-	-	-
Unclassified	574	410	17	-	-	-	-	-	1,001
Total (other than herring)	11,933	19,211	3,228	5,932	93,361	-	-	-	133,665
Total (other than herring):									
1961	12,959	21,370	4,291	5,576	57,693	1,304	-	-	103,193
1960	14,396	19,684	3,509	9,678	50,698	-	46	98,011	
1959	9,594	13,097	4,819	7,619	38,371	-	5	73,505	
1958	21,691	15,768	4,072	3,939	43,572	-	27	89,069	
1957	24,960	13,836	13,889	2,956	32,886	-	23	88,550	
1956	18,161	13,704	28,875	101	31,807	-	-	92,648	
1955	20,006	13,535	22,939	-	35,982	-	41	92,503	
1954	17,075	8,950	9,621	-	26,182	-	-	61,828	

<sup>1/</sup>Round fresh weight.

Note: Includes landings in foreign ports.

than offset a decline in herring landings due to bad weather.

**Fishing Grounds:** In the past ten years, there has been a strong shift in Faroese fishing effort to the waters off Greenland--mostly West Greenland. Almost 70 percent of the demersal fish catch was taken from Greenland fishing grounds in 1962, as compared with only 38 percent in 1953. The greater catches off Greenland have resulted from the addition of larger, better equipped vessels to the fishing fleet.

of Southern European countries to produce more of their own cured fish. The share of the catch marketed fresh, however, advanced from 6.2 percent in 1953 to 20.5 percent in 1961, dropping back to 16.3 percent in 1962 when lower market prices prevailed in British ports. Between 1953 and 1962, the part of the catch devoted to freezing increased from only 0.2 percent to 7.5 percent, due mainly to the demand for fillets and blocks in the United States.

Table 4 - Faroese Fishing Fleet, July 1, 1963				
Type of Vessel	Total	Average Age	Total Tonnage	Average Size
No.	Years			(G.R.T.) <sup>1/</sup>
Long Line:				
Steel	48	2	12,650	260
Wood: 20-70 G.R.T. <sup>1/</sup>	46	22	1,852	40
Over 70 G.R.T. <sup>1/</sup>	14	26	1,495	106
Smacks	47	72	4,659	99
Schooners <sup>2/</sup>	12	40	2,226	185
Steam trawlers <sup>2/</sup>	8	13	6,247	780
Motor trawlers	6	11	4,147	691
Total	181	-	33,276	-

<sup>1/</sup>Gross registered tons.<sup>2/</sup>Hand-line and long-line vessels.

**Disposition of Catch:** In the past ten years, the disposition of the Faroese fisheries catch has changed markedly. From a peak of 92.4 percent in 1953, the portion used for curing dropped steadily to only 76 percent in 1962, reflecting market demand and the tendency

Table 5 - Faroese Fisheries Catch and Disposition, 1952-1962

Year	Disposition					Reduction (Meal & Oil)
	Landings	Fresh Market	Freezing	Curing	Canning	
1962	143,520	23,407	10,733	109,120	85	175
1961	120,078	24,598	5,749	89,626	80	25
1960	109,428	24,264	4,909	79,678	132	445
1959	87,200	13,182	2,197	69,064	157	600
1958	106,740	15,044	2,789	90,182	25	700
1957	105,584	7,726	1,492	95,428	135	803
1956	116,316	5,861	2,445	107,320	90	600
1955	105,619	7,481	2,095	95,926	42	75
1954	89,434	6,788	759	81,523	364	-
1953	88,756	5,504	147	82,047	263	795
1952	87,183	6,621	120	80,077	365	-

<sup>1/</sup>Round fresh weight basis.

Note: Includes landings in foreign ports.

**Future Production and Markets:** The production of dry-salted fish may continue to decline. The large, more desirable sizes of cod are less readily available since Iceland extended its fishery limits. Former importers, such as Spain, are importing more wet-salted

**Faroe Islands (Contd.):**

cod as well as producing more of their cured fish requirements. Dry-salted fish sales are now limited largely to Brazil where variations in the value of the currency present problems.

Faroeese wet-salted fish currently are in good demand even in producing countries such as Norway and Iceland. Faroeese exporters do not handle all the wet-salted fish produced by Faroeese vessels. Foreign buyers often request that Faroeese fishing vessels land their wet-salted fish directly in European ports.

The United Kingdom is practically the sole market for iced Faroeese fish. If prices are no more favorable than in 1962, less iced fish will be landed there and more will be processed in the Faroe Islands. The same will be true if British fishery groups block landings of iced fish when Faroeese fishery limits are extended on March 12, 1964.

The production of frozen fillets should continue to increase with the bulk going to the United States. Other countries also are becoming more important buyers. Soviet Bloc countries--East Germany, in particular--are taking increasing quantities of Faroeese saithe fillets, a cheaper product than cod or haddock. If the British block landings of iced Faroeese fish, or if the Faroeese exploit more fully the nearby Faroeese and Icelandic grounds, the supply of fish for filleting may increase substantially.

Salted herring production varies with the catch, which was poor in 1962. Contracts have been made with Sweden, Denmark, and the Soviet Union for substantial shipments of salt herring from the 1963 production.

Porbeagle production from the present Northwest Atlantic grounds is expected to taper off beginning in 1964 because of diminishing resources. More vessels are expected to enter the fishery from Nordic countries, making it less profitable. The Italian market also is limited in the quantity it can take at profitable prices. At least one porbeagle fishing vessel plans to seek tuna with long lines in the Western Atlantic, the Caribbean Sea, and later off Northwest Africa. If the porbeagle fishery becomes unprofitable, the freezerships in the fishery will probably operate in Greenland waters, freezing groundfish.

Since the demand for Norway lobsters is good, production may be expected to increase. (Regional Fisheries Attaché for Europe, United States Embassy, Copenhagen, October 2, 1963.)

**German Federal Republic****FISHING INDUSTRY PROPOSES FREE INTERNATIONAL MARKET FOR NORTH SEA AREA:**

The German Fishing Industry Federation has called for a free international market in fish for the entire North Sea area.

A federation spokesman in Hamburg saw the proposed European fisheries union as one which would embrace all European Economic Community (EEC) countries and others with seaboards in the area.

The spokesman suggested that such a union would have a greater economic effect than a common EEC fishing policy, which would have to take into account the entirely different interests of North Sea and Mediterranean fisheries.

The spokesman said that the proposed union would imply cooperation between EEC and the European Free Trade Association (EFTA).

All members would enjoy the same status, and membership would entail full fishing rights for all within each other's territorial waters. Each would have the right to land catches in any harbor in any member country, the spokesman said. (EFTA Reporter, October 1, 1963.)

**Ghana****CONTRACTS FOR JAPANESE-BUILT FISHING VESSELS:**

A £G5.7 million (US\$16 million) contract for the construction of 10 stern trawlers and 2 carrier vessels for the Ghana Fishing Corporation was signed by Ghana's Minister of Agriculture and a Japanese shipbuilding and engineering firm, on August 6, 1963. According to Ghanaian newspaper reports, 5 of the trawlers will be 1,350 tons each, the other 5 of 1,850 tons, and the carriers 1,200 tons.

### Ghana (Contd.):

The first two of the vessels will arrive in Ghana in November 1964. Delivery of the vessels is expected to be completed in 1967 and payments will extend over seven years. (United States Embassy, Accra, August 11, 1963.)

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## TWO BRITISH-BUILT STERN TRAWLERS RECEIVED:

Ghana's Minister of Agriculture was the principal speaker at a ceremony at Tema Harbor in Ghana, on August 6, 1963, to welcome two British-built stern trawlers. Purchased from a British shipyard as part of a £G970,200 (US\$2.7 million) contract signed in 1961, the vessels are 127'6" long with 29'6" beams and 11'8" molded depths. They are Diesel-powered and can store 240 metric tons of fish under refrigeration.

In his welcoming speech the Minister stated that the vessels were the first to be delivered to the Ghana Fishing Corporation and would form the nucleus of the Corporation's fishing fleet. Actually, the trawlers are not the "first" deliveries as the British shipbuilding firm also supplied two tuna purse seiners in 1962, but they were later returned to England for repairs and reportedly sold. (United States Embassy, Accra, August 11, 1963.)

Note: See Commercial Fisheries Review, September 1963 p. 92.



## Haiti

## UNITED STATES FIRM TO ESTABLISH FISHING ENTERPRISE IN HAITI:

A contract to establish a fishing enterprise in Haiti was signed in March 1963, between a New York City wholesale fishery firm and three members of the Haitian Cabinet. The contract was published in the official Haitian Government organ Le Moniteur No. 256, on March 15, 1963, and was in force as a decree as of the date of publication. The decree provides certain exclusive rights and privileges to the United States firm for the ten-year duration of the contract which is renewable at the option of the parties involved. The capital of the new firm to be set up in Haiti will be \$50,000.

Under the terms of the contract, the Haitian Government authorizes the United States firm (1) to engage in the fishing industry and trade on the northern, western, and southern coasts of Haiti, and in frog breeding; (2) the Haitian Government shall lease to the Contractor, land necessary for the development of this enterprise along the coast; (3) install one or more plants in Haiti on all spots where natural sources permit centralized preparation, freezing, storage, packing, and shipping in the coastal area at Port-au-Prince or outside that city; (4) give to the Contractor all facilities and necessary privileges to utilize his own ships, boats, or other means of sea transportation in use in fishing industries. (United States Embassy, Port-au-Prince, August 9, 1963.)



## Iceland

**EXPORTS OF FISHERY PRODUCTS,  
JANUARY-JUNE 1963:**

During January-June 1963, there was a considerable increase in exports of frozen herring and herring meal as compared with the same period in 1962, according to the Statistical Bureau of Iceland's Statistical Bulletin, August 1963. Exports of fish meal and herring oil showed a considerable decrease in the first 6 months of 1963.

Product	Icelandic Fishery Exports, January-June 1963 with Comparisons					
	Jan.-June 1963			Jan.-June 1962		
	Qty.	Value f.o.b.	U.S. \$	Qty.	Value f.o.b.	U.S. \$
	Metric Tons	Kr.	U.S.\$ 1,000	Metric Tons	Kr.	U.S.\$ 1,000
Salted fish, dried . . . . .	1,411	28,467	660	1,324	25,586	593
Salted fish, preserved . . . . .	14,000	31,153	4,000	17,167	21,113	3,000
Salmon fish fillets . . . . .	767	8,877	243	817	9,241	246
Wings, salted . . . . .	1,402	17,499	406	837	9,624	223
Stockfish . . . . .	3,034	81,538	1,892	4,853	124,400	2,882
Herring on ice . . . . .	7,224	25,417	543	4,899	17,144	3,800
Herring, frozen ice . . . . .	1,000	1,000	100	1,000	1,000	100
Herring, salted . . . . .	24,212	131,883	3,053	14,717	79,213	1,836
Other frozen fish, whole . . . . .	1,612	16,698	434	918	11,882	278
Frozen fish fillets . . . . .	28,662	52,645	12,286	28,326	45,865	11,257
Fish, dried, salted, frozen . . . . .	1,000	1,000	100	1,000	1,000	100
Frogs, frozen . . . . .	539	10,497	244	597	11,377	264
Canned fish . . . . .	105	6,823	154	120	6,873	159
Cod-liver oil . . . . .	4,609	31,749	737	5,233	30,403	733
Other fish roe . . . . .	3,580	3,580	358	2,421	1,500	150
Other roe for food, salted . . . . .	3,175	4,191	1,042	2,143	3,366	833
Roels for bait, salted . . . . .	974	7,203	167	311	2,113	49
Herring, salted . . . . .	17,520	166,558	36,686	16,200	149,570	3,470
Herring oil . . . . .	15,614	62,717	1,455	19,917	85,740	1,989
Whale oil . . . . .	1,000	1,000	100	1,000	1,000	100
Whale oil . . . . .	2,035	11,042	262	368	2,554	59
Fish meal . . . . .	5,614	33,294	772	16,397	102,480	2,370
Herring meal . . . . .	32,368	196,149	49,977	22,102	140,706	3,266
Other fish meal . . . . .	858	4,476	104	324	3,204	71
Whale meat, frozen . . . . .	1,000	1,000	100	2,065	5,000	127
Liver meal . . . . .	283	1,970	46	180	1,185	36
Whale meal . . . . .	100	558	13	302	1,567	36
Whale meat, frozen . . . . .	838	5,887	137	131	1,997	36

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**EXPORTS OF FISH OILS,  
JANUARY-JUNE 1963:**

Iceland's exports of herring oil during the first 6 months of 1963 declined by 22 percent

**Iceland (Contd.):**

to 17,212 short tons from 21,954 tons in the comparable period a year earlier.

Exports of cod liver oil (including non-freezing, nondestearinated, and industrial cod liver oil) amounted to 5,080 tons in January-June 1963--up from the 2,793 tons exported in January-June 1962. Exports of redfish (ocean perch) oil totaled 127 tons in January-June 1963 as compared with 16 tons in January-June 1962. (Foreign Agriculture, October 7, 1963.)

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**NEWLY CONVERTED FREEZER****TRAWLER'S MAIDEN TRIP SUCCESSFUL:**

The Icelandic side trawler Narfi, converted recently to a freezer trawler, made a successful first voyage to the Greenland grounds, after spending three days in Icelandic waters testing the freezing equipment.

Most of the catch consisted of medium-size cod which, with some haddock, was headed and frozen into blocks. A total of 5,820 blocks was landed at Grimsby, the total catch amounting to 302 tons. The catching rate on the grounds was about 16 tons per day of all fish and the freezing rate 12 tons per day. Quality was said to be excellent, due, it is thought, to the improved freezing equipment which insures better contact between plates and fish, and to the care taken in bleeding and washing the fish on board.

The Narfi conversion involved the building of covered accommodation for the freezers on the port well deck and other modifications, carried out by a Bremerhaven shipyard. (World Fishing, September 1963.)

**Indonesia****NEW OCEANOGRAPHIC RESEARCH VESSEL DELIVERED:**

A new oceanographic research vessel, the Jalanidhi, was delivered to the Indonesia Government on January 12, 1963. Construction began on August 4, 1962, and she was launched on October 29, 1962. The Jalanidhi was scheduled to participate in the International Indian Ocean Expedition.

The Jalanidhi is 746 gross tons; 53.9 meters (176.8 feet) over-all length; and is fitted with Diesel machinery. Accommodation is provided for 12 officers, 26 crewmen, and 26 research workers. She is fitted with a balloon station, a code recorder, and radiosonde equipment for aerological observation. Other equipment includes a precision echo sounder for 10,000-meter deep-sea use, a fish "mirror" (an echo sounder operable in all directions), a tele-finder, and an echo sounder for detecting characteristics of the bottom of the sea.

In addition, there is a carbon-14 tracer for the measurement of basic productivity of sea-water samples and a soft X-ray projector for X-ray observation of fish. For experiments on embryological and physiological studies of plankton, fish eggs and larvae for estimation of stock size and fluctuation of fisheries resources, a graduated thermal incubator is installed, and there is also a nongraduated thermal incubator for embryological and taxonomical studies of fish eggs and larvae. (National Oceanographic Data Center, Newsletter, July 31, 1963.)

**Iran****UNITED STATES FIRMS BID FOR CAVIAR:**

The National Iranian Fisheries Company (Shilat) opened bids submitted by four United States firms for the sale of 60 metric tons of caviar on September 16, 1963. The winning bids submitted by a New York City firm for the various grades of caviar were as follows: Beluga, No. 1, 15 metric tons at US\$15.88 a pound; Beluga, No. 2, 2 metric tons at \$7.71 a pound; Osetra, No. 1, 2 metric tons at \$15.20 a pound; Osetra, No. 2, 2 metric tons at \$7.71 a pound; Sevruga, No. 1, 5 metric tons at \$9.98 a pound; Sevruga, No. 2, 23 metric tons at \$5.44 a pound; Pressed, No. 1, 6 metric tons at \$3.40 a pound; and Pressed, No. 2, 5 metric tons at \$2.95 a pound. The total value of the contract was \$1,123,500. Bids for the best grade (Beluga No. 1) caviar ranged from a high of \$15.88 to a low of \$13.61. (United States Embassy, Tehran, September 19, 1963)



**Japan****CATCH OF ATLANTIC OCEAN BIG-EYED TUNA HIGHER IN SEPTEMBER 1963:**

The Japanese Atlantic tuna long-line vessels are reported to have taken unusually large quantities of big-eyed tuna since early September 1963. Their big-eyed catch is said to run well over 50 percent of their landings, compared to 20-30 percent for yellowfin. This development may adversely affect Japanese frozen tuna exports to Italy since Italian importers are said to be very reluctant to purchase tuna if the ratio of yellowfin to big-eyed in a shipment exceeds 70:30.

September c.i.f. prices paid by Italy per metric ton of frozen tuna imports were quoted at US\$390-400 (dressed, without head but with tail) for yellowfin and \$330-340 for big-eyed.

Abundance of big-eyed in the Atlantic tuna catch is expected to intensify competition among Japanese exporters to sell that species to Czechoslovakia, the only European country that is said to be willing to accept pure shipments of big-eyed. Czechoslovakia in September was offering \$335-338 per metric ton for big-eyed, delivery Hamburg, Germany, or Trieste, Italy. (Suisan Tsushin, September 16, 1963.)

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**CANNED TUNA IN BRINE SALES TO UNITED STATES, SEPTEMBER-NOVEMBER 1963:**

Japanese tuna packers, at a directors' meeting held on September 26, 1963, voted to release for export to the United States 150,000 cases of canned tuna in brine per month, or a total of 450,000 cases between September-November 1963.

The Japan Canned Foods Exporters Association, which also convened a meeting on that same date, announced that it would go along with the packers' decision. Accordingly, for September the Association agreed to offer for sale 150,000 cases but did not specify the amount of each kind of pack (white meat or light meat) to be sold. Export f.o.b. prices will be the same as for previous sales, i.e., \$10.50 per case for white meat tuna and \$7.65 per case for light meat tuna for No.  $\frac{1}{2}$  (7-oz.) 48's.

Japanese canned tuna in brine approved for export to the United States as of the end

of September totaled 2,010,000 cases. Japan's export target for the year (December 1962-November 1963) is 2,300,000 cases. (Suisan Tsushin, September 27, 1963; and other sources.)

\* \* \* \* \*

**EXPORTS OF CANNED TUNA IN OIL, APRIL-JULY 1963:**

According to data compiled by the Japan Tuna Packers Association, canned tuna in oil approved for export by the Association's sales company for the period April-July 1963 totaled 682,331 cases. This represents an increase of 128 percent over exports approved

Principal Countries of Destination	Japanese Canned Tuna in Oil Exports, April-July 1962-63	
	1963	1962
West Germany	229,493	102,134
Canada	82,093	65,074
Lebanon	42,186	9,025
England	39,084	12,400
Netherlands	36,194	30,702
Switzerland	34,907	10,835
Belgium	34,659	2,065
Aden	32,499	3,939
Saudi Arabia	30,963	2,155

during the corresponding period in 1962, which totaled 299,402 cases. (Suisan Tsushin, September 21, 1963.)

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**EXPORTS OF CANNED TUNA IN OIL TO CANADA APPROVED:**

The Japanese Ministry of International Trade and Industry has approved the application of the Canned Tuna Packers Association to export chunk-style packs of canned tuna in oil to Canada. Heretofore, only exports of solid and flake-style packs were authorized by the Japanese Government.

The following f.o.b. Japan export prices per case were established for the different chunk-style packs: Tuna in oil: white meat chunk ( $\frac{1}{4}$  lb.) 48's, \$5.05; white meat chunk, No.  $\frac{1}{2}$  (6  $\frac{1}{2}$ -oz.) 48's, \$8.65; white meat chunk, No. 1 (13-oz.) 24's \$7.80; white meat chunk (4-lb.) 6's, \$9.60; light meat chunk ( $\frac{1}{4}$ -lb.) 48's, \$4.10; light meat chunk, No.  $\frac{1}{2}$  (6  $\frac{1}{2}$ -oz.) 48's, \$6.90; light meat chunk, No. 1 (13-oz.) 24's, \$6.30; and light meat chunk, 4-lb. 6's, 7.35. (Suisan Keizai Shimbun, September 15, 1963.)

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Japan (Contd.):

**GREEN MEAT IN TUNA EXPORTS  
CONTINUES TO BE PROBLEM:**

Claims against exports of green meat tuna continue to plague Japanese exporters of frozen tuna to the United States, according to the Japan Frozen Foods Inspection Corporation, a public corporation responsible for examining the quality of frozen foods for export. About 3 percent of the frozen tuna exported to the west coast and about 1 percent shipped to the east coast of the United States are rejected by U. S. packers due to the occurrence of a greening condition, which happens principally in yellowfin tuna.

Research is continuing in Japan to find ways of maintaining good quality tuna meat color. The study on the green meat condition is being conducted by a scientist at the University of Tokyo. (Minato Shimbun, September 20, 1963.)

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**LARGER VESSELS REQUESTED  
FOR SOUTH PACIFIC TUNA FISHERY:**

Japanese firms conducting fishing operations from tuna bases in the South Pacific Ocean are seeking Government permission to operate 180-ton refrigerated tuna clippers, which have a wide range of operation. At present, they are authorized to employ only fresh fish carrying-vessels under 100 gross tons, which have a limited operating range.

The Japanese overseas tuna base operators are experiencing increasing difficulty in contracting ice boats to fish for them because of declining catches in waters adjacent to their bases. Similarly, Japanese tuna mothership operators are faced with the same problem, and for that reason one company has decided not to dispatch a second tuna mothership fleet to the South Pacific this year. (Suisan Tsushin, September 26, 1963, and other sources.)

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**NEW TUNA TRANSSHIPMENT  
PORT IN EAST AFRICA PROPOSED:**

Eleven Japanese fishing companies are jointly seeking approval for the establishment of a transshipment port in East Africa, from which frozen tuna can be exported directly to Europe and to the United States. At the present time, transshipments of Indian

Ocean tuna for export to the United States are only permitted via Penang (Malaya) and Singapore. Transshipments of Indian Ocean tuna to Japan proper are permitted only at Durban, South Africa. (Suisan Tsushin, September 12, 1963, and other sources.)

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**OFFICIAL VISITS UNITED STATES  
TO DISCUSS CANNED TUNA TARIFF:**

The Japanese Minister of Forestry and Agriculture, who was scheduled to attend the Japan-Canada Ministerial Economic Conference in Canada on September 25-26, 1963, planned to visit the United States after that conference. Reportedly, the Minister planned to discuss with the U. S. Secretary of the Interior the U. S. tariff on canned tuna in brine and the present method of assessing duties on that product.

It was reported that Japanese canned tuna packers are concerned over the low United States pack of canned tuna in 1963, because it would result in a smaller quantity of foreign-produced canned tuna in brine that can be admitted into the United States in 1964 at the lower duty rate of  $12\frac{1}{2}$  percent ad valorem. Under the present United States tariff structure, ad valorem duty of  $12\frac{1}{2}$  percent is assessed on canned tuna in brine imports amounting to 20 percent of the total United States domestic production for the previous calendar year. Imports exceeding that amount are dutiable at 25 percent ad valorem. Japanese packers are said to be seeking arrangements through their Government whereby some adjustment can be worked out for 1964 imports only. (Suisan Keizai Shimbun, August 23, 1963.)

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**RESEARCH VESSEL TO STUDY  
YELLOWFIN TUNA IN EASTERN PACIFIC:**

The Japanese Government-operated research vessel Shoyo Maru, 602 gross tons, was scheduled to depart Japan on September



A Japanese research vessel, Shoyo Maru.

## Japan (Contd.):

26, 1963, on a 175-day exploratory cruise to the eastern Pacific Ocean to study the geographical distribution, ecology, and size distribution of yellowfin tuna. At the invitation of the Japanese Government, scientists from the Inter-American Tropical Tuna Commission and from the U. S. Bureau of Commercial Fisheries will board the vessel for part of the cruise. (Suisan Keizai Shimbun, September 12, 1963, and other sources.)

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## SOUTH PACIFIC TUNA CATCH POOR AS OF EARLY SEPTEMBER 1963:

The two Japanese mothership tuna-fishing fleets, Yuyo Maru (5,500 gross tons) and Nojima Maru (8,800 gross tons), operating in the South Pacific Ocean in the general vicinity of the Fiji Islands, were reported to be experiencing poor fishing as of early September 1963. The 33 catcher vessels of the Yuyo Maru fleet were reported to be averaging 2.4 metric tons per day as compared to 2.8 and 3.3 metric tons in 1962 and 1961, respectively; the 68 catcher vessels of the Nojima Maru fleet were said to be averaging 2.1 metric tons per day compared to 2.6 and 2.8 metric tons in 1962 and 1961, respectively. The large Japanese tuna vessels fishing with portable vessels (20 tons or less) in the same general area as the two mothership fleets were also reported to be doing poorly averaging two metric tons or less per catcher vessel per day.

As a result of prevailing poor fishing conditions this year and evidences of a continuing decline in tuna availability over the last few years in the South Pacific, Japanese vessel operators are seeking more promising fishing grounds elsewhere in the Pacific. One evidence of this is the renewed interest shown by a large Japanese fishing company (operators of the Yuyo Maru fleet) in establishing a tuna fishing base in Tahiti. That company, which normally operates two tuna mothership fleets per year on a rotational basis, has decided not to dispatch a second mothership fleet to the South Pacific later this year. Reportedly, that company has not been able to attract a sufficient number of small tuna vessel owners to form a second mothership fleet. (Suisan Keizai Shimbun, September 12; Suisan Tsushin, September 20, 1963.)

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## TUNA RESOURCES OFF WEST COAST OF SOUTH AMERICA SURVEYED:

The Japanese Fisheries Agency on September 18, 1963, released a report on the results of the December 1962-March 1963 tuna survey in the eastern Pacific Ocean by the Government-operated research vessel Shoyo Maru, 602 gross tons. According to that report, tuna, especially big-eyed, were found in abundance north of the equator in the eastern Pacific, but were completely absent south of the equator to 13° S. latitude. The absence of tuna in the areas fished by the Shoyo Maru was attributed to the influence of the cold Peru Current. The area between 15° S. lat., at 95° W. long., and 30° S. lat. showed good fishing potential for albacore, yellowfin, and striped marlin, particularly between 200°-30° S. latitudes and 100°-110° W. longitudes.

The exploratory fishing conducted by the Shoyo Maru has shown that the eastern Pacific Ocean off South America holds definite promise as a suitable tuna fishing ground, particularly for land-based type operations employing small and medium-size tuna vessels. (Suisan Keizai Shimbun, September 19, 1963.)

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## TUNA MOTHERSHIP OPERATIONS OFF SOUTH AMERICAN WEST COAST:

The Japanese portable-vessel-carrying tuna mothership Keiyo Maru (3,691 gross tons), fishing with eight 20-ton vessels in the eastern Pacific, is reported to have landed, as of August 31, 1963, a total of 817 metric tons of tuna, spearfish, and shark. This amounts to a catch average of well over two metric tons per catcher boat per day. The mothership's catch consists of: big-eyed, 309.8 metric tons (37.9 percent of total catch); yellowfin, 157.6 metric tons (19.2 percent); spearfish, 140.5 metric tons (17.2 percent); shark and other miscellaneous species, 209.2 metric tons (25.7 percent).

The Keiyo Maru refueled at Balboa, Panama Canal Zone, and departed that port September 1 on the second leg of her planned 185-day trip, which started June 5. (Hokkai Suisan, September 16, 1963.)

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## TUNA VESSEL OWNERS SET UP COOPERATIVE AT MALAYSIA BASE:

The Japanese Overseas-Based Tuna Fishery Cooperative Association, an organization

## Japan (Contd.):

of tuna vessel owners operating out of Penang, Malaysia, was inaugurated at a meeting held in Tokyo on September 26, 1963. The Association is under the auspices of the Japan Federation of Tuna Fisheries Cooperative Associations.

Objectives adopted by the Association for the first year are:

(1) Advise Association members on applicable regulations and revisions thereof, extend guidance on business management and on safe operation of vessels, and develop measures to stabilize fish prices. Guidance to be coordinated with the Japan Federation of Tuna Fishermen's Cooperative Association.

(2) Progressively undertake sales activity after the Association develops into a strong organization, structurally and financially.

(3) Extend loans to vessel owners according to vessel size as follows: (a) pre-departure loans, US\$13,889-\$22,222; and (b) loans for refrigeration equipment, \$13,889-\$16,667. At the end of each trip, a fixed amount will be deducted from the value of the trip to repay the loan. The loans will carry an interest charge of 9 $\frac{1}{2}$  percent.

(4) Purchase 7,750 kiloliters (2,046,000 gallons) of fuel per year to supply 30 fishing vessels based at Penang. (Suisan Tsushin, September 27, 1963.)

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#### ATLANTIC TRAWL FISHERY DEVELOPMENTS:

East Atlantic: A Japanese fishing company accepted delivery of its new 2,500-ton stern trawler Kurama Maru on August 31, 1963. Built at a total cost of approximately US\$1.5 million, the vessel was scheduled to depart on her maiden voyage to the Atlantic Ocean trawling grounds around September 10.

Specifications of the Kurama Maru are: horsepower (main engine) - 2,750; length - 260 feet; beam - 44 feet; draft - 28 feet. The vessel is equipped with loran, direction finder, fish finder, and radar.

With the addition of the Kurama Maru, the owners will have 8 trawlers in the 2,500-ton class operating in the Atlantic Ocean. The first was the Amagi Maru, which was launched in July 1960. The other six trawlers are: Ibuki Maru, Unzen Maru, Hidehiko Maru, Oe Maru, Kaibun Maru, and Kiso Maru. In addition, the company operates several older trawlers under 1,000 tons gross in the Atlantic Ocean. (Minato Shim bun, September 12 and August 31, 1963.)



Fig. 1 - Japanese stern-ramp factory trawler Akebono Maru No. 51.

Another Japanese fishing company, which is presently operating two 1,500-ton stern trawlers (Akebono Maru Nos. 50 and 53) off the west African coast with excellent results, was reported to be planning on expanding its Atlantic trawl fleet. Under present plans, the company intends to divert to African waters the two 1,500-ton stern trawlers Akebono Maru Nos. 51 and 52 currently operating in the North Pacific. As replacements, the company would construct two 3,500-ton stern trawlers for year-round operation in northern waters. (Minato Shim bun, August 30 and Shin Suisan Shim bun Sokuho, September 10, 1963.)

North Atlantic : The 1,200-ton Japanese trawler Aoi Maru No. 2, the first Japanese trawler to operate in the North Atlantic Ocean, terminated operations in mid-September, slightly ahead of schedule. The trawler has been operating out of Saint Pierre Island (French), fishing primarily for cod. The vessel will undergo repairs in Japan before returning to the North Atlantic fishing grounds. (Minato Shim bun, September 12, 1963.)



Fig. 2 - Typical catcher boat of the Tenyo Maru No. 3 fleet.

Another company's stern trawler Tenyo Maru No. 3 (3,700 gross tons) was scheduled to depart Tokyo sometime between October 1-5 for the North Atlantic Ocean. Assigned to her are two 300-ton trawlers, Chuyo Maru No. 6 and Eiya Maru, which departed Tokyo on September 24. Those vessels will operate out of Miquelon Island (French possession) off the southern coast of Newfoundland for approximately 18 months, and will fish primarily for cod, which will be processed on the Tenyo Maru No. 3 for export to the United States. (Suisan Tsushin, September 12, Nihon Suisan Shim bun, August 28, 1963.)

The introduction in Japan of merluza (hake) caught by the Japanese trawlers in the Atlantic Ocean has aroused considerable interest in the Japanese industry in view of the market potential of that species. Some Japanese fish processors are reported to be considering the possibility of using hake, instead of whale meat, tuna, and other species of fish (which are becoming less available and more expensive) as an ingredient for fish sausage. (Minato Shim bun, August 30, 1963.)

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Japan (Contd.):

**STERN TRAWLERS FOR  
ATLANTIC OCEAN FISHERY PLANNED:**

Three Japanese fishery companies have submitted applications to the Fisheries Agency to construct stern trawlers ranging in size between 2,500-3,000 gross tons for assignment to the Atlantic Ocean.

Six other fishing companies are planning on submitting applications to the Agency to construct large stern trawlers, also for assignment to the Atlantic Ocean. However, the Fisheries Agency is expected to limit the number of new trawlers to a total of eight vessels over 1,000 gross tons for assignment to the Atlantic Ocean. (Suisan Tsushin, September 26, 1963, and other sources.)

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**PRODUCTION OF BERING SEA  
BOTTOMFISH FISHING FLEETS  
AS OF MID-SEPTEMBER 1963:**

Of the 19 mothership fleets licensed to operate in the Bering Sea east of  $170^{\circ}$  E. long. in 1963, all but 5 fleets have returned to Japan. Total production of the 19 fleets, as of mid-September, was reported to have exceeded 257,000 metric tons. The production consists of: Alaska pollock, 104,000 tons; flatfish, 66,300 tons; herring, 31,500 tons; shrimp, 27,000 tons; rockfish, 15,000 tons; and cod, 14,000 tons.

Two of the 19 fleets engaged in fish-meal production. The fish-meal factoryship Gyo-  
kuei Maru (10,537 gross tons) produced 15,300 metric tons of fish meal and about



Fig. 1 - Trawler attached to Japanese fish meal factoryship Gyo-  
kuei Maru, operating in Bering Sea.

1,500 metric tons of fish oil. The Soyo Maru (11,192 gross tons), which was due to leave the fishing grounds in late September, produced as of mid-September about 6,000 metric tons of fish meal.



Fig. 2 - Japanese trawler No. 18 Soho Maru operating in the Bering Sea as part of a mothership fleet.

The total production of the two fish-meal factoryships is expected to be consumed in Japan. It is believed that informal agreements have been made to release the fish meal on the Japanese domestic market for US\$178 per metric ton. (Suisan Keizai Shim bun, September 28, 1963.)

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**BERING SEA BOTTOMFISH  
OPERATIONS MAY BE REORGANIZED:**

Unprofitable operations were reported by five Japanese Bering Sea mothership fleets licensed to fish for bottomfish during 1963 in Areas A, B, and CF (east of  $170^{\circ}$  E. longitude and west of  $175^{\circ}$  W. longitude but south of the Navarin-Sarichef line), according to the Japanese periodical Suisan Keizai Shim bun, August 29, 1963. Those fishing fleets (No. 1 Tosui Maru, 381 gross tons; No. 12 Sumiyoshi Maru, 578 gross tons; No. 15 Kotoshiro Maru, 701 gross tons; No. 31 Banshu Maru, 1,772

## Japan (Contd.):

gross tons; and Ishiyama Maru, 3,539 gross tons) were reported to have met, on an average, only two-thirds of their respective catch targets.

The five fleets, which were originally scheduled to return to Japan in late October 1963, terminated their operations by September, partly because of poor prospects for halibut fishing. However, their principal reason for leaving the grounds so early was said to be the intense fishing competition they encountered. The increased competition was attributed to the action taken by the Japanese Fisheries Agency in opening the waters between  $170^{\circ}$  E. longitude and  $175^{\circ}$  W. longitude to Japan-based trawlers in 1963. About 72 Japan-based trawlers were reported to have converged on the Olyutorskii fishing grounds this year.

The Japanese periodical further stated that the Japanese Fisheries Agency was considering a plan to encourage year-round fishing in the Bering Sea, and to reorganize mothership-fleet operations in 1964. Most of the 19 mothership bottomfish fleets operating in the Bering Sea in 1963 were reported to have lost money. This occurred in spite of a reduction of 4 motherships and about 40 catcher vessels in the fleet licensed to operate in 1963.

A proposal to restrict the size of motherships in the Bering Sea bottomfish fleet to not less than 1,000 tons gross was being studied. From the standpoint of efficiency, the Fisheries Agency was reported to believe that the employment of 2,000 to 3,000-ton motherships accompanied by 2 or 3 catcher vessels would be ideal. Motherships of that type could be designed so that they could also fish, thereby reducing operational costs materially. In addition, they could operate on a year-round basis, rather than on a seasonal basis, like many of the larger motherships (5,000 to 10,000-ton class) which are presently deployed in the Antarctic Ocean during the winter whaling season and the Bering Sea bottomfish fishery during the summer season.

One reason given for the failure of the 1963 Bering Sea mothership fleet operation was the great emphasis placed on long-line gear. Those fleets which primarily fished long-line gear were said to have lost the most money. The Fisheries Agency hopes

to guide fishing companies in diversifying their fishing gear, with emphasis on trawl gear, so that they will be in a more flexible position to fish for different species of fish.

The regional (Shimonoseki) newspaper Minato Shimbun reported on September 6, 1963, that the first phase of the Japanese Government's three-year plan to gradually transfer trawlers from other depressed fisheries to the land-based North Pacific trawl fisheries would be completed by the end of 1963. By then, about 40 trawlers will have been permitted to transfer to the northern water fishery.

The second phase of the vessel transfer program is scheduled to begin in 1964, but, as a result of increased competition on the fishing grounds between land-based trawlers and mothership fleets, the Fisheries Agency is expected to carefully review its vessel transfer policy. The Fisheries Agency reportedly thinks that further transfers should not be allowed. However, the Hokkaido Prefecture Government is reported to be already planning on permitting 32 trawlers under Hokkaido registry to transfer to the northern water trawl fishery under the second phase of the vessel transfer program.

Note: See Commercial Fisheries Review, April 1963 p. 57.

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PERMIT REQUESTED FOR  
BERING SEA FISH-MEAL OPERATION:

One of the large Japanese fishing companies, which terminated its fish-meal operations in the eastern Bering Sea in 1963, is reported to have applied to the Japanese Fisheries Agency to reactivate the venture in 1964. The company plans to use the fish-meal factoryship Renshin Maru (14,094 gross tons) for the operation.



Japanese fish-meal factoryship Renshin Maru operating in Bering Sea.

## Japan (Contd.):

The company has decided on reactivating its Bering Sea fish-meal operation as a result of: (1) failure to come to agreement with Chile on establishing joint fish-meal operations off that country; and (2) improved economic outlook for 1964, based on current fish-meal trends in Japan. (Suisan Tsushin, September 25, 1963.)

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## BERING SEA HERRING

## FISHERY TRENDS, AUGUST 1963:

Five Bering Sea mothership fleets consisting of the Soyo Maru, 11,192 gross tons; Shinyo Maru, 3,811 gross tons; Shikishima



Shinyo Maru, mothership factoryship, operates with other fishing vessels.

Maru, 10,144 gross tons, Itsukushima Maru, 5,871 gross tons; and the Seifu Maru, 8,269 gross tons, were having good herring fishing and their total combined herring catch, as of August 20, 1963, had exceeded 20,000 tons. The Japanese ex-vessel price for herring was reported to have dropped 10 yen per kilogram (US\$25 per short ton) from the original price of 85 yen per kilogram (\$214 per short ton). But even at the lower price, the mothership fleets were said to be able to fish for herring on a profitable basis. (Suisan Keizai Shimbun, August 28, 1963.)

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CHIBA COMPANY TO CONTINUE  
VENEZUELAN JOINT ENTERPRISE:

A Japanese company in Chiba Prefecture, which in August 1959 established a joint fishing company in Venezuela, is reported to have decided to continue participation in that company. The joint enterprise had been beset with various management problems, and a special delegation from Chiba Prefecture, headed by the prefectural vice-governor, was dispatched to Venezuela to discuss the

problems with Venezuelan authorities. The negotiation, which began on August 11, 1963, reportedly resulted in strengthening the management authority of the Japanese and in obtaining assurance of greater cooperation from the Venezuelan Government. (Nihon Suisan Shimbun, September 11, 1963.)

Editor's Note: A September 1962 press report indicated that the joint company was operating a total of seven fishing vessels in the Caribbean Sea.

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JAPANESE-BRAZILIAN FISHERIES  
FIRM TO EXPAND:

The Japanese-Brazilian jointly-owned cold-storage and fish-processing company (capital about US\$3 million) at Recife, Brazil, will be enlarged to double its present capacity in 1964, according to the company's president.

The joint company operates three 300-ton tuna vessels and two spiny lobster fishing vessels. Present base facilities of this company include a 500-ton capacity cold-storage plant, 15-ton ice machine, 10-ton freezing plant, and a packing plant. (Minato Shimbun, September 22, 1963.)

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FISHERIES AGENCY INCREASES  
BUDGET FOR FY 1964:

The Japanese Fisheries Agency is requesting a budget of US\$61 million for fiscal year 1964 (April 1964-March 1965). This represents an increase of \$13.6 million, or 29 percent, over the FY 1963 budget request of \$47.4 million.

Under a new program titled "Promotion of Fisheries Products Consumption," the Fisheries Agency is requesting \$117,400. That appropriation would be used to assist frozen fish-marketing campaigns in Japan and to subsidize the installation of refrigeration facilities for holding fish at 40 agricultural cooperatives in 4 prefectures.

To assist the saury industry, the Fisheries Agency is requesting \$138,900 for the purpose of stabilizing saury prices.

For the purpose of maximizing the utilization of fisheries resources and promoting fishing efficiency, the Fisheries Agency plans

**Japan (Contd.):**

to expand the existing fishing condition forecasts. The forecasts are presently the responsibility of the Tohoku Regional Fisheries Research Laboratory. The Tohoku Laboratory publishes, at regular intervals, fishing charts showing oceanic conditions (temperature isotherms, currents, etc.) and fishing results, including landings and prices, on the skipjack, albacore, and saury fisheries. Under the FY 1964 budget proposal, the program would be expanded on a national basis to cover the Pacific Ocean mackerel fishery off northern Japan, the Japan Sea mackerel and sardine fisheries, and the East China Sea mackerel fishery.

For existing programs, the Agency is requesting large increases in appropriations for biological research related to international fisheries as well as for the guidance, supervision, and control of the northern water (North Pacific, Okhotsk Sea, and Bering Sea) fisheries and other distant-water fisheries. Budget submissions for those programs total \$1.8 million, an increase of \$0.6 million (50 percent) over the current year's allotment. (Nihon Suisan Shimbun, September 9, 1963, and other sources.)

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**FROZEN CUTTLEFISH  
EXPORTS TO PORTUGAL:**

Two Japanese exporting firms are reported to have concluded agreements to export to Portugal a total of 2,000 metric tons of frozen cuttlefish at prices ranging from US\$142 to \$154 per metric ton (believed to be f.o.b. prices). Reportedly, export prices this year are down over 20 percent from last year, and the decline is attributed to stiffer competition between exporters. The highest price paid in 1962 was \$230 a ton for 470 tons of cuttlefish. Exports that year totaled 2,770 tons.

The frozen cuttlefish contracted for export were to be shipped from the port of Kushiro, Hokkaido, in October 1963 for delivery to Lisbon. According to Japanese exporters, there is a likelihood that Portugal may purchase an additional 500 to 600 tons of frozen cuttlefish this year. (Nihon Keizai Shimbun, August 25, 1963.)

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**MODIFIED UNITED STATES PURSE-SEINE GEAR SUCCESSFUL IN SKIPJACK TUNA FISHERY:**

The Japanese skipjack tuna industry has been experimenting since 1962 with one-boat purse-seine gear, employing a power block. It involves a United States-type purse seine which has been modified for local fishing conditions. The skipjack vessels fishing with the modified purse seines and power blocks have been able to outfish other skipjack vessels equipped with conventional pole-and-line gear. Views are now being expressed among Japanese skipjack vessel operators that this development may start a trend toward replacing pole-and-line gear with one boat purse-seine nets. (Suisan Keizai Shimbun, September 20, 1963.)

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**SEA WATER TO FRESH WATER CONVERSION APPARATUS SUCCESSFUL ON TUNA VESSEL:**

A device which produces fresh water from sea water was reported to have been successfully installed in a Japanese tuna vessel operating out of Yaizu, Japan. The converter contains an evaporator which vaporizes the sea water used in cooling the ship's engine. The vaporized sea water is then cooled by means of a vacuum, producing distilled water. The converter can produce 1 ton of fresh water from 5 tons of sea water and supply an average of 1 to 2 tons of fresh water per day.

The advantages of the converter were cited as follows: (1) produces fresh water of good quality, (2) converter is light and compact, (3) no fuel expense is required since the heat of coolant water is utilized, (4) manufactures fresh water even while vessel is in operation, and (5) low in cost and safe in operation. (Minato Shimbun, August 30, 1963.)

\* \* \* \* \*

**TANKER TO REFUEL  
FISHING VESSELS AT SEA:**

The Japan National Federation of Tuna Fishermen's Cooperative Associations is sending the 1,500-ton tanker Shimmei Maru to the central and eastern Pacific Ocean tuna fishing grounds on a trial basis to serve as a "mobile fuel depot" for refueling tuna-fishing vessels at sea. The tanker will rendezvous at predetermined locations on the high seas with tuna vessels and refuel those vessels at

## Japan (Contd.):

sea. Approximately 90 Japanese tuna vessels are expected to participate in the first ship-to-ship high seas fueling experiment.

The cost of fuel oil to the tuna vessels participating in the trial will be about 20,000 yen per kiloliter (US\$0.21 per gal.). Ordinarily the vessels would refuel at Hawaii or at Tahiti. Fuel cost at those localities is over 15,000 yen per kiloliter (\$0.16 per gal.). Added to that cost is the rather high port entry and docking fees, so actual total cost of fuel purchased at those ports amounts to over \$0.21 per gallon.

The loss in fishing time and other costs to a 400-ton tuna vessel, which spends 10 days for refueling purposes, is said to amount to about 4 million yen (\$11,000). By refueling at sea on the fishing grounds, that cost would be eliminated, thereby greatly increasing vessel operating efficiency.

The Shimmei Maru was scheduled to depart Yokohama on October 10, 1963, and will first call at Honolulu before proceeding southeastward to a point located at approximately 3° S. latitude, 140° W. longitude where the initial rendezvous will be made with tuna vessels fishing in that general locality. The tanker will then proceed on an easterly course to 120° W. long.; then south along 120° W. long. to 10° S. lat.; then northeast to 5° S. lat., 100° W. long., before running to Balboa (Panama Canal Zone) for fuel around December 3, 1963.

On the return journey to Japan, the Shimmei Maru will head for a point at approximately 15° S. lat., 95° W. long., and then proceed on a straight course to approximately 5° S. lat., 150° W. long.

Throughout the trip radio contact will be maintained with the 90 tuna vessels participating in the high seas fueling experiment. At predetermined points along the route traveled by the tanker, those vessels will rendezvous with the tanker to receive fuel. (Suisan Keizai Shimbun, September 22, 1963)

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**GOVERNMENT LEADERS PRESS FOR  
REVISION OF NORTH PACIFIC  
TRIPARTITE TREATY:**

Government leaders, at a meeting held on September 12, 1963, for the purpose of de-

termining Japan's official position with respect to the Japan-United States-Canada Fisheries Treaty, agreed to definitely press for removal of the abstention principle at the Treaty renegotiation scheduled to begin on September 16 at Tokyo, and unanimously expressed support of the Prime Minister's decision to seek conclusion of a new fisheries treaty. As to whether Japan will serve notice of her intention to terminate the present Treaty in the event negotiations should fail, the conferees agreed that Japan's notification of intention is not an end but a means for concluding a new treaty.

Japan expects the United States to firmly insist on the continuance of the abstention principle. However, information received by the Japanese Government on September 12 indicated that the United States was willing to consider replacing the wording "voluntary abstention principle" in the text of the present Treaty with such other words as "restraint or conservation," provided the effect remained the same. In commenting on this development, the Fisheries Agency Director and the Production Division Chief are quoted as saying that Japan cannot accept this compromise unless the rewording brings about a change in the basic character of the abstention principle, but the fact that the United States has shown her readiness to consider this change is being carefully evaluated by Japan.

Japanese Government authorities are emphasizing the fact that a new fisheries treaty concluded along the line proposed by Japan at the June 1963 Washington conference will not result in what President Kennedy states as irreparable losses to fishery resources of the Pacific Ocean, and are claiming that the Japanese proposal is the most rational, equitable approach to resource conservation. The Japanese Government on September 12 informally announced the makeup of the Japanese Government delegation scheduled to take part in the Treaty renegotiation slated to convene in Tokyo from September 16. (Suisan Keizai Shimbun, September 13, 1963.)

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**PROGRAM FOR TRANSFER OF  
COASTAL VESSELS TO NORTHERN  
TRAWL FISHERIES UNDER STUDY:**

The Japanese Fisheries Agency is reported to be planning to discontinue in 1964, the program it initiated in January 1961 of transferring vessels engaged in the coastal trawl

## Japan (Contd.):

fishery to the northern water trawl fishery. Purpose of the program was to solve the conflict over domestic fishing grounds between non-trawl coastal fishermen and coastal trawl fishermen and to stabilize management of the coastal trawl fishery.

The vessel transfer program was to be carried out in two phases. The first phase, which began on January 1, 1961, is scheduled to end March 31, 1964, after three years. By that deadline, a total of 150 trawlers are to be taken out of the coastal trawl fishery and transferred to the distant northern water trawl fishery.

Area of operation assigned to the transferred trawlers in 1961 was the waters north of  $48^{\circ}$  N. lat. between long.  $148^{\circ}$  E. and  $170^{\circ}$  E. In 1963, the area was extended easterly by  $15^{\circ}$  to  $175^{\circ}$  W. long.

The second phase of the program, to begin after April 1964, is to be carried out pending a full review of the progress and effect of the three-year program.

During the first phase, a total of 150 trawlers from five northern prefectures--Hokkaido, Aomori, Miyagi, Iwate, and Fukushima--are scheduled to be transferred to the northern water trawl fishery. Hokkaido's vessel quota is 80 trawlers, Aomori and Miyagi 30 each, and Iwate and Fukushima a combined total of 10. However, as of June 20, 1963, only 99 vessels were transferred or approved for transfer. They ranged in size primarily between 70 to 300 tons gross.

The 150 vessels to be transferred have been divided into two categories, called "sengyosen" (a vessel exclusively engaged in only one fishery) and "kengyosen" (a vessel engaged in more than one fishery). Of the 150 vessels, 100 have been designated as "sengyosen." They will be taken out completely from the coastal trawl fishery and be licensed to only engage in the land-based northern water trawl fishery. The 50 vessels designated as "kengyosen" are to be taken out from the coastal trawl fishery for no less than 6 months and be licensed to operate for 6 months in the northern water trawl fishery. All vessels transferred can be replaced with newer and larger vessels, within certain limitations.

Available data in 1961 on the bottomfish resources off Kamchatka Peninsula indicated that commercial fishing operations were feasible. However, Hokkaido vessel owners, who have access to rather abundant resources close by, without having to travel 700-800 miles to the trawling grounds off lower Kamchatka, and who did not wish to convert or replace their vessels at great cost to themselves, showed little enthusiasm for the program for a long while. As of June 20, 1963, a total of only 27 vessels under Hokkaido registry had taken advantage of the program.

On the other hand, as of that same date the four prefectures in northern Honshu (main Japanese island) had more than filled their quota, with a total of 72 vessels being transferred or approved for transfer. Fishermen in those prefectures were willing to make the transfer since they lacked good trawling grounds off their prefectures.

Main grounds fished by the Japan-based trawl fleet in the North Pacific are off the southern tip of Kamchatka Peninsula near Paramushiro Island and in the Okhotsk Sea near the southwestern tip of the Kamchatka Peninsula. Operations in those areas have been found to be most efficient for the smaller trawlers under 200 tons gross but have appeared to have proven a hardship for the larger vessels. Thus, in 1963 the Fisheries Agency expanded the fishing grounds to include the waters west of  $175^{\circ}$  W. long.

This expansion of the fishing grounds, which opened the grounds between Cape Navarin and Cape Olyutorskii to the Japan-based trawlers, resulted in improving the economic outlook of those vessels. Reportedly, large numbers of the transferred vessels began fishing the Cape Navarin-Cape Olyutorskii region in 1963, and they did quite well. As a result, Hokkaido vessel owners, who heretofore were reluctant to transfer to the northern water trawl fishery, are now reported to be willing to consider making the change. They are expected to request an extension of the program since Hokkaido will not be able to meet its quota (80 vessels) by the end of March 1964.

On the other hand, the mothership-type bottom fishing fleets are reported to have suffered as a consequence of having to compete with the Japan-based trawlers on the same grounds in 1963. Some of the large

## Japan (Contd.):

companies operating mothership fleets in the Navarin-Olyutorskii region claim they had to recall their fleets earlier this year due to the intense competition on the fishing grounds, and to resultant dwindling catches. They are now asking that their area of operations in the Bering Sea be further expanded eastwards. Because of this development, i.e., intense competition on the Bering Sea fishing grounds, the Fisheries Agency is said to be not now planning on licensing the transfer of additional coastal trawlers to the northern waters after April 1964.

The Agency is also reported to feel that in the Bering Sea the employment of large motherships are not economically practical and favors the employment of large 2- to 3,000-ton trawlers fishing with 2 or 3 smaller trawlers. The large trawler, in addition to fishing herself, would serve as a mothership to the smaller trawlers. In this connection, one Japanese fishing company is planning to divert to the Atlantic Ocean its two 1,500-ton trawlers presently assigned to the Bering Sea and the North Pacific Ocean and replace them with two 3,500-ton trawlers, each fishing with 2 or 3 smaller trawlers. (Suisan Shuhō, August 1963; 1962 Japan Yearbook of Fisheries, and miscellaneous news-paper reports.)

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## NORTH PACIFIC WHALE CATCH QUOTA INCREASED:

The Japanese Fishery Agency recently notified a Japanese fishing firm that the Agency will grant an increase of its current North Pacific baleen whale catch quota by 60 blue-whale units (from the presently allocated quota of 227 to 287 units) in order to compensate that firm for losses incurred by suspension of a joint venture with another firm to fish for king crab south of the Alaska Peninsula. Distribution of the profits from additional whales caught will be divided between those two firms. Two other Japanese whaling fleets (Kinju Maru and Nitto Maru), currently operating in the North Pacific, were not granted increases for their baleen whale catch quotas.

In connection with the increased quota for the North Pacific, it is reported that Japanese fisheries circles are critical of the Government's policy for high-seas fishing, saying

that it lacks consistency and tends to be "safety first."

Officials of the firms owning the two whaling fleets are not raising the issue because their catch quotas have not been increased, but they have expressed dissatisfaction that (1) equality of the three companies is the rule for North Pacific whaling and it is unreasonable to treat crab fishing in the same light with whaling, and (2) despite the fact that North Pacific whaling is being operated autonomously on the basis of the Japanese Government's own judgment, earlier requests for an increase in the quota were denied on the grounds of preserving the whaling resources. (Fisheries Attaché, United States Embassy, Tokyo, August 8, 1963.)



## Morocco

## EXPORTS OF FROZEN SARDINES TO FRANCE RESUMED:

According to Moroccan press reports, exports of frozen sardines to France were scheduled to begin late in September 1963. These exports were stopped early in July after French dockers refused to unload Moroccan sardines because of local surpluses. According to the original agreement between the French and Moroccan Governments, exports of sardines would stop between July 15 and September 15. (United States Embassy, Rabat, September 20, 1963.)



## New Zealand

## IMPORTS OF CANNED SALMON FROM U.S.S.R. INCREASED:

During the latter part of September 1963, the New Zealand press published claims of some importers of salmon that the Soviet Union was granted substantial import license for cars, cameras, matches, and canned fish for the

Species	July 1, 1962-June 30, 1963		Calendar Years					
	NZ\$ 1,000	US\$ 1,000	NZ\$ 1,000	US\$ 1,000	NZ\$ 1,000	US\$ 1,000	NZ\$ 1,000	US\$ 1,000
Salmon...	343	960	208	582	751	2,103	492	1,378
Other fish.	633	1,772	370	1,036	899	2,507	1,457	4,080
Total . . .	976	2,732	578	1,618	1,650	4,610	1,949	5,458

### New Zealand (Contd.):

licensing year, July 1, 1963, to June 30, 1964. It is alleged that this licensing arrangement is a part of the agreement reached with the Soviets coincident with the negotiation of the recently signed most-favored-nation treaty.

A comment attributed by the press to the Minister of Customs that import licenses for canned fish are 125 percent of the 1962/63 allocation requires explanation. Although the 1963/64 Licensing Schedule authorizes 125 percent of 1962 licenses, the immediately preceding 1962/63 Licensing Schedule authorizes 33-1/3 percent of 1960 licenses (calendar year). Thus, the effective license authorization for 1963/64 appears to be about 43 percent of 1960 which tends to substantiate importers' claims that there has been a great shortage of salmon on the New Zealand market. (United States Embassy, Wellington, September 20, 1963.)



### Nicaragua

#### SHRIMP FISHERY TRENDS, SECOND QUARTER 1963:

A large United States fishery company is negotiating for the purchase of the assets of a shrimp-processing firm in Bluefields which was taken over recently by the National Bank in Nicaragua. If consummated, the arrangement would entail an initial capitalization of US\$400,000.

A new shrimp-processing plant in Puerto Somoza was due to begin operating about mid-July this year. The new shrimp-processing plant will export to the United States. (United States Embassy, Managua, September 12, 1963.)



### Norway

#### FISHING AND WHALING TRENDS, SECOND QUARTER 1963:

A committee named by the Norwegian Ministry of Fisheries to make recommendations for an investment program for the fishing fleet in the period 1963-65, submitted its report during the second quarter of 1963. The main theme of the proposed program is to promote investment in larger and more modern fishing vessels. The report called for the scrapping of 1,000 fishing vessels annually for the next three years and recommends that Government lending through the State Fisheries Bank and the District's Development Fund be directed largely to the financing of larger fishing vessels.

Pronouncements concerning Norway's future as a major pelagic whaling nation were pessimistic during the quarter when it was announced that Norway's most modern factoryship Thorshövdi was up for sale to the Japanese. Further concern was caused by the sale to Japan of the British factoryship Southern Harvester with its whale quota of 5 percent or 500 blue whale units. This not only meant the end of British pelagic whaling but also the end of Tønsberg's participation inasmuch as the Southern Harvester's crew and most supplies and equipment have been furnished by this Norwegian city. Concerned for the future of the 480 whalers who would be out of work and over the loss in foreign exchange involved, the Government refused to permit the sale of the Thorshövdi.

Norwegian whaling circles blame Norway's poor whaling results in the past several years on the decimation of the whale population due to overly large global quotas. At the 1963 International Whaling Commission talks in London, the Norwegian delegates pressed for a drastic reduction in the global quota and an inspection system. The agreed reduction from the 1962/63 quota of 15,000 blue whale units to 10,000 units in the 1963/64 season was far from Norway's wish for a 4,000-5,000 global quota, and the agreement on an international inspection system, the complete conservation of the humpback whale, and the partial conservation of the blue whale, failed to alleviate Norwegian fears that the faster and more modern catcher boats of the Japanese and the Russians will contribute further to the decimation of the whale population.

As of the end of the second quarter of 1963, the following Norwegian vessels were due to participate in the 1963/64 whaling season: the Thorshövdi with 7 catcher and 2 buoy boats; the Thorshavet and the Kosmos, both with the same number of supporting boats as the Thorshövdi; and Sir James Clark Ross with 5 catchers and 2 buoy boats. This amounts to an increase of one catcher over the previous year's number. Norway's 1963/64 whale quota is 2,800 blue whale units. (United States Embassy, Oslo, September 5, 1963.)

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#### NEW "POCKET" FACTORY STERN-TRAWLER:

A Norwegian shipyard delivered the 123-foot stern-trawler Rønstad to its owner-skip-

## Norway (Contd.):

per about the end of this past summer. In general lines, the new vessel resembles the 205-foot stern trawler Langva, and is already becoming known as the "pocket" factory trawler. The wheelhouse follows the Norwegian preference for being well forward, the engine room being aft, and the fishroom midships, with the processing deck above it. The 23-man crew is accommodated forward.

The Rønstad, carries fish heading, filleting, and skinning machines. The daily output of fish fillets on the vessel is estimated at 6 metric tons. The vessel is equipped with a plate freezer having a capacity of 6-8 tons per day. A total of 120 tons of fillets can be stored in the refrigerated hold at  $-25^{\circ}$  C. ( $-13^{\circ}$  F.).

The vessel's trawl winch, which is housed under cover at the fore end of the trawl deck, is in two parts, of split-winches type. Each main drum has an auxiliary drum for the gilson wires, the trawl bridles being hauled in on the main drums as in side-trawler practice. The winches are controlled from an operating position forward on the trawl deck, from which both main and gilson drums can be controlled. Trawl warp meters indicate the amount of wire paid out from each drum. Hydraulic pressure for the winch is obtained from a two-stage pump driven from the fore end of the main engine through a hydraulic clutch, the latter being controlled from the deck.

The trawl doors of the Rønstad are hauled up to a lower position on the transom than usual and locked in position by a special device. They can then be reached easily from the deck above. The dan leno bobbins are hauled up to the winch, the ground rope bobbins being then hauled on by an electric capstan, which is also used to empty the cod end when it has been lifted on board by the gilson.

The trawl gear is handled by 3 men--2 on deck and 1 in the operating position. Fish pass through a hydraulically-operated hatch to the processing deck below. Also hydraulically operated is the safety gate on the after ramp, which, in its stowed position, is flush with the ramp surface.

A load-sensing device has been incorporated into the gallows blocks, which will react to a sudden increase in warp tension

brought about by a trawl hand-up, actuating an electric circuit which slows the engine revolutions or could, alternatively, reduce propeller pitch. In the same way, uneven tension of the warps can actuate the circuit and sound an alarm.

The vessel is powered by a Diesel engine which develops 765 hp. at 1,225 r.p.m., and drives a stainless steel controllable pitch propeller through a  $4\frac{1}{2}: 1$  reduction gear. There are two 117 hp. auxiliary engines. Ninety-six tons of fuel are carried. The main hull dimensions are: length over-all 123 feet, breadth 26.2 feet, depth to main-deck 13 feet, and depth to shelter deck 20.1 feet. Service speed is 11.5 knots.

The reported price of the Rønstad was 2.3 million kroner (US\$322,000), although it is not clear whether this includes the navigational and fish-finding equipment. (World Fishing, September 1963.)



## Peru

#### FISH-MEAL INDUSTRY OBTAINS LOAN TO CONSOLIDATE DEBTS:

In recent months, Peru's great fish-meal industry has passed through a critical situation due to: (1) an off season in the anchoveta fishery; (2) unsold stocks of fish meal; (3) limited bank credits; and (4) tight financial situation due to heavy debts and lack of working capital on the part of a large majority of the plants. Investment in the industry has been estimated at \$190 million, of which \$37 million represent invested capital; the remainder, credits from banks, foreign and domestic suppliers, and financing organizations.

A start has been made in consolidating the debts of the fish-meal industry with the action of industry representatives in obtaining a \$10 million loan from a United States bank. Loan operations will be handled by the Banco Industrial del Peru, which will guarantee 25 percent of the amount of each loan made to individual plants. The remaining 75 percent will be guaranteed by the commercial banks to which plants are indebted. It is rumored that an additional \$5 million will be made available to the industry by other United States banks.

Compared with a total estimated indebtedness of \$153 million, a \$10 or \$15 million loan

### Peru (Contd.):

is considered a small sum. However, it represents a start, and if the industry will use the available financing to pay off debts and to consolidate, and not continue increasing production capacity, the promising future predicted for the industry can be realized. (United States Embassy, Lima, September 26, 1963.)



### Philippines

#### MARKET FOR UNITED STATES CANNED SARDINES:

Canned sardines are considered a staple item in the Philippines, and the maintenance of an adequate supply at reasonable prices is of such political importance that the Government has reduced tariffs from 15 percent ad valorem to 8 percent ad valorem (January 21, 1962), and it subsidizes about 40 percent of the imports.

The Government subsidization of imports is implemented by the National Marketing Corporation (NAMARCO) which offers periodic tenders. NAMARCO goods are imported tax-free and are sold through the NAMARCO system of selected Filipino retailers. About 60 percent of sardine imports, however, are handled through normal commercial channels. Total imports amounted to \$13.7 million in 1961 and \$6.6 million in 1962; thus commercial imports amounted to over \$8 million and almost \$4 million in 1961 and 1962, respectively.

A good opportunity for United States sardine packers is presented by the Government's decision to implement the boycott on trade with South Africa proposed by the United Nations General Assembly in November 1962. Since 1961 virtually all imports of sardines have been supplied by South Africa (more than \$5 million in 1962), but with this major competitor ruled out, the door is thrown open to other suppliers. Unless the current NAMARCO requirements (500,000 cases) can be met by United States or other suppliers, however, it is likely that the Government will waive the boycott as regards sardines; it has already been under strong pressure to do so.

The most popular sardine pack is that packed in tomato sauce. Natural sauce and spiced olive oil also have fairly significant appeal. However, cottonseed oil or soybean oil packs are not particularly favored in this market. The best-selling cans are 15-ounce ovals and 5-ounce talls ("jitneys"). Flats are not considered salable in the mass market.

The Filipino consumer is extremely brand-conscious and often reluctant to try unfamiliar brands. On the other hand, he has a "built-in" preference for United States brands. United States packers interested in reestablishing a position in this market should seriously consider promotional campaigns designed to establish the image of United States sardines in general, as well as of their own brands.

Winning bids (c.&f. prices) for NAMARCO tenders on June 17, 1963, were as follows: South African canned sardines in tomato sauce: 48/15-oz., ovals, \$7.60 a case; 48/15-oz., talls, \$6.15 a case; 48/8-oz., \$4.25 a case; and 100/5-oz., \$6.75 a case. Quotations (c.&f.) for Japanese canned sardines packed in tomato sauce were: 48/15-oz., talls, \$5.00 a case; 24/15-oz., ovals, \$3.85 a case; and 100/5-oz., talls, \$5.65 a case. (United States Embassy, Manila, September 20, 1963.)



### Solomon Islands

#### FISHERIES POTENTIAL PROMISING:

A rich fishery awaits development around the British Solomon Islands, according to an Australian fisheries official who has been taking part in a research and training program. Using a 46-foot converted shrimp fishing vessel, which he sailed from Australia, the Australian official has been taking local crews to sea to learn fishing techniques, simple navigation, engine maintenance, and fish handling, as part of his duties as Fisheries Officer for the Protectorate.

Among the species which he reports as being plentiful are yellowfin and striped tuna, inshore bonito, and Spanish mackerel. Coral crayfish were also plentiful and were caught by hand at night by natives using torches.

The local fishing enterprise includes three cooperatives, one of which had developed a method of drying fish in the form of fish flakes, which can be stored in polythene for some time. Some boatbuilding training has also been given, and locally-built 25-footers are now in operational use.

In an interview with the Australian magazine *Fisheries Newsletter*, the Fisheries Officer said that the development of Solomon Islands fisheries by commercial concerns would be welcomed. (*World Fishing*, September 1963.)



### South Africa Republic

#### PILCHARD-MAASBANKER FISHERY, JANUARY-JUNE 1963:

The catch of the pilchard-maasbunker fishery off the Cape west coast of the South Africa Republic in the first 6 months of 1963 was 377,217 short tons pilchards, 12,782 tons maasbunker, and 14,634 tons mackerel--a total of 404,633 tons. By the end of June last year 400,394 tons pilchards, 63,263 tons maasbunker, and 19,321 tons mackerel had been caught--a total of 492,928 tons. At the end of June 1961, the total catch was 474,072 tons and for the same period in 1960, the total catch was 336,869 tons.

According to figures released by the Division of Sea Fisheries, the June 1963 catch was 77,966 tons pilchards, 322 tons maas-

## South Africa Republic (Contd.):

banker, and no mackerel. This compares with 13,615 tons pilchards, 10,585 tons maas-banker, and 34 tons mackerel in June last year; and with 43,181 tons pilchards, 11,439 tons maas-banker, and 10 tons mackerel in June 1961.

The June 1963 catch yielded 18,014 short tons fish meal, 884,871 imperial gallons fish body oil, 4,605,080 pounds canned pilchards, and 214,968 pounds canned maas-banker. (The South African Shipping News and Fishing Industry Review, August 1963.)

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## ANOTHER VESSEL CONVERTED FOR TUNA FISHERY:

A new offshore tuna fishing venture off the west coast of South Africa is to be made by a Cape Town company. The company has bought the refrigerated vessel Marinette (285 gross tons) which was previously used for food shipments to West African ports.

Modifications are to be made to the deck and the refrigerating system, and the Marinette will be equipped for long-line and pole fishing. The Marinette, which was built in 1955, is 108 feet long, has a 23-foot beam, and is powered by a 6 cylinder Diesel engine. She will be able to carry at least 120 tons of refrigerated tuna to port.

A company official in Cape Town said: "Of course, the project at this stage is purely exploratory, but we feel that it has great possibilities. Later we may get 1 or 2 more ships. The Marinette will be fully equipped to stay out for at least 40 days without re-fueling." (The South African Shipping News and Fishing Industry Review, August 1963.)

\* \* \* \* \*

## NEW LARGE PLASTIC-GLASS FISHING VESSEL:

What may be the world's largest glass fiber and plastic fishing vessel should by now have been completed, according to a report in The South African Shipping News and Fishing Industry Review. The design plans called for a vessel 67½ feet in length with a beam of 21 feet, powered by a Diesel engine of 220 hp. at 1,800 r.p.m., driving a 52-inch propeller through a 4½ : 1 reduction gear.

Construction was done in a shipyard in Cape Town, South Africa, which had previously built smaller resin-glass vessels. The hull of the new vessel was built by a method known as "sandwich" construction. (A layer of foamed plastic is "sandwiched" between lay-ups of glass fiber and resin.) Plans called for a final hull thickness of 1½ inches which would contain 40,000 square yards of glass mat or cloth. Unlike normal resin-glass lay-ups, the "sandwich" method does not require a highly polished rigid female mould. (World Fishing, September 1963.)



## South-West Africa

## FISHERIES TRENDS, AUGUST 1963:

South-West Africa's tanker Anella (about 5,500 tons) loaded all the available fish oil at Walvis Bay during the last week of June 1963. The entire shipment was destined for the United Kingdom.

The Anella was due back at Walvis Bay in November for another cargo of fish oil stock for the United Kingdom.

During the first half of July the quality of the fish, which has been the poorest for many years, improved and the oil yield rose to 11 to 12 gallons a ton of fish. The six factories were still curtailing canning operations in the hope that the quality of the fish would improve during August and September.

The first of two more fish oil bulk storage tanks at Walvis Bay was completed during the middle of July. The tanks will have a capacity of about 2,000 tons each. (The South African Shipping News and Fishing Industry Review, August 1963.)

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## TWO NEW LICENSES GRANTED FOR FISH-REDUCTION PLANTS:

The Executive Committee of the South-West Africa Administration announced on August 24, 1963, that it had granted two new licenses for fish-reduction plants. One of the new plants will be located at Walvis Bay and the other at Luderitz. Each plant will have a quota of 90,000 tons of pilchards for reduction into fish meal and oil, and each is allotted a concession for 25 years. The license for

## South-West Africa (Contd.):

Luderitz includes an additional export quota of 500,000 pounds of spiny lobsters. The plants will have to be in operation by 1965. (United States Embassy, Pretoria, Sept. 5, 1963.)



## Taiwan

FISHERIES TRENDS,  
JANUARY-JUNE 1963:

Taiwan's fisheries production during the first half of 1963 was estimated at 169,746 metric tons, about 3 percent above that in the same period of 1962. The increase would have been larger, except for a 22-percent decline in the yield from pond fish culture, following frost and drought damage.

Shrimp exports during the first half of 1963, are estimated to be about double the 1962 total exports. Most of these exports have been going to Japan.

In connection with the development of a long-line tuna fleet, the authorities at Kaohsiung Harbor are pressing plans to construct a new fishing harbor. Government officials have, however, revised plans for the harbor, reducing the estimated cost from NT\$89 million (US\$2.2 million) to below NT\$60 million (US\$1.5 million).

In April the Land Bank (JCRR) and the Provincial Fishermen's Association agreed in principle to establish an NT\$30 million (US\$750,000) interest-free revolving loan fund to help rehabilitate debt ridden fishermen's associations.

During the 2nd quarter of 1963, the China (Taiwan) Fisheries Corporation continued technical cooperation agreement negotiations with several foreign fishing corporations, including those of Malagasy, the Philippines, and Thailand, in an effort to expand Taiwan's deep-sea fishery operations and provide outlets for the catch. (United States Embassy, Taipei, August 5, 1963.)



## United Kingdom

BREAD MADE FROM FISH PROTEIN  
CONCENTRATE EXHIBITED AT  
NUTRITIONAL CONFERENCE:

The first firm in Great Britain to produce fish flour for human consumption is located in Aberdeen, Scotland, and produces large quantities of fish meal for animal feed. This firm is now ready to go into large-scale production of this new meal for export to underdeveloped countries fighting the problem of malnutrition. The firm has been conducting research on fish meal refinement for almost 20 years. This research has resulted in a highly refined flour that can be incorporated into any food.

In mid-August this year their specially baked loaves of bread were on show at an Edinburgh exhibition on nutrition. The bread (baked in Edinburgh) with fish flour sent from Aberdeen, had a faint taste of fish, depending on the fish flour concentration.

The Aberdeen firm's exhibit which was concurrent with the International Congress on Nutrition, was organized by the British White Fish Authority which has actively supported the venture.

The exhibit aroused worldwide interest among delegates on the use of proteins in basic foodstuffs.

The managing director of the Aberdeen firm in an interview, stated that the value of fish flour was in its high protein content. The fish meal had been refined to such an extent that, for human consumption, the flour was more than 80 percent protein. Half an ounce of the flour, he explained, would be quite sufficient to cover the daily protein requirement of one man.

The Aberdeen area officer of the White Fish Authority, said they now realized fish was the best source of protein concentrate in the world. It was "the practical solution to the fear of hunger in underdeveloped countries."

Cod, whiting, and haddock are the only fish used in the milling process at present. (Fish Trades Gazette, August 17, 1963.)

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LOANS AND GRANTS FOR FISHING  
VESSELS AS OF JUNE 30, 1963:

British White Fish Authority figures released in August 1963 reveal that up to July,

## United Kingdom (Contd.):

358 grants have been approved this year for new near- and middle-water trawlers.

Twenty-six grants have been approved for conversion of near- and middle-water trawlers to oil fired, steam or Diesel propulsion and grants for new vessels and new engines for the inshore industry number 882 and 546, respectively.

Of grants for new trawlers, Aberdeen received 102, Grimsby 83, Lowestoft 75, Fleetwood 48, Granton 22, Milford Haven 13, North Shields 12, Hartlepool 2, and Hull 1. For conversions, Lowestoft got 5, Milford Haven 13, and Aberdeen 8.

Grants to the inshore industry were split 406 for new vessels and 336 for new engines to England; 16 for vessels and 30 for engines to Wales; and 460 for vessels and 180 for engines to Scotland.

Since the program started, grants worth £12,588,809 (US\$35.2 million), have been approved. Total value of loans approved is £31,157,657 (US\$87.2 million). (The Fishing News, August 30, 1963.)

\* \* \* \* \*

## NEW TRAWLER ORDERED FROM POLAND:

A new conventional side-fishing deep-water trawler has been ordered by one of the large fishing companies in Grimsby, England, from a shipyard in Gdynia, Poland.

The new vessel, which is due to be delivered in February, 1965, will be the first Grimsby trawler to be built in Poland.

The trawler will be 184 feet  $3\frac{1}{2}$  inches between perpendiculars, 207 feet  $3\frac{1}{2}$  inches over-all, with a moulded breadth of 32 feet  $9\frac{1}{2}$  inches, and a mean draught of 14 feet 6 inches.

The main engine will be a Diesel engine developing 1,800 b. hp., at 250 r.p.m., and is expected to give a service speed of 15 knots. The winch engine will be a 390 hp. Diesel and the winch will have a capacity of 1,600 fathoms of 3-inch warp. The bunker capacity of 194 tons will enable the trawler to stay at sea for up to 30 days. The fish-hold capacity will be 20,270 cubic feet.

All the latest electronic equipment will be provided and will include a gyro compass and automatic steering, two radars, and automatic direction finder.

A novel feature of the crew's quarters is the provision of a sick bay, the first to be provided in a Grimsby trawler.

The galley is all-electric and a fully equipped workshop with lathe and drills is provided for the engineers. (Fish Trades Gazette, September 17, 1963.)

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## SOME AGREEMENT REACHED ON SHARE-SYSTEM FOR CREW OF AUTOMATED STERN TRAWLERS:

Talks between the British owners of an "automated" small size stern trawler and the Transport and General Workers' Union have produced near-agreement over manning and remuneration scales for members of the crews of the revolutionary, 5-man crew class ships.

With the push-button trawlers, the style for which has been set by the British firm, high mechanization cuts down the crew for North Sea vessels by over half from the customary 11 to 5.

As such, these trawlers are not covered by any existing agreements.

But after the first stage of negotiations, the regional secretary of the Union and the management have reached virtual agreement.

The vessel's owners commented that further negotiations would take place and felt that all points would then be clarified.

The new type vessel was due to be delivered in late September. She will carry two officers, and three crewmen. (The Fishing News, August 30, 1963.)

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## TRAINING COURSES AID YOUNG MEN ENTERING TRAWL FISHERY:

Improved training facilities are now available to young men wishing to become trawlermen in Hull, England. They are being put into effect by a Recruitment and Training Officer on loan to the Hull Fishing Vessel Owners' Association.

## United Kingdom (Contd.):

Cook's assistants are now placed on trawlers by the Recruitment and Training Department so that any young man who wants to take up this work applies directly to the Training Officer instead of offering his services to individual firms. The Officer then arranges for the recruit to have a medical examination, records his name, and he is "called up" when his turn comes.

New recruits for the engineroom are given a trip in a trawler as a supernumerary and for this they are paid. At the end of the trip they are then sent on a four-week induction course at the Nautical College, after which they are available to firms as firemen proper.

It is hoped that all future entrants into the engineroom will be trained under this program. In due course, as the number of Diesel-driven trawlers increases and steam-driven trawlers decreases, it is planned to start a similar program for Diesel engine operators which would eventually take the place of the present course in steam engines.

The deckhand-learners' course has been increased from 4 to 6 weeks and on completion of the 6 weeks, learners will be sent to one of the net lofts for a further week's practical training in net-mending and so on. The course also includes two new lectures, "The Meaning of Discipline" and "Safety at Sea."

The biggest improvement is probably in the training of firemen to become second engineers. This course, which was originally 2 weeks steam and 2 weeks Diesel, has been increased to 6 weeks steam and 10 weeks Diesel. It is hoped to award some form of certificate on completion of the course.

A new regulation has been introduced to ensure that no man may sail as bosun or mate without holding a First Class Net-Mending Certificate. The bosuns' course has included this certificate, but it has been possible for a deckhand to take his mate's certificate and eventually sail as mate without ever having held a First Class Net-Mending certificate. Future courses for mate will include instruction and examination for this certificate. (The Fishing News, August 23, 1963.)



## Uruguay

## FISHERY RESOURCES TO BE STUDIED:

Although Uruguay has access to considerable fish reserves in an area estimated at one million square kilometers, this resource has been underexploited. In 1961, of 6.1 million tons landed in South America only 9,000 tons were landed in Uruguay. The use of fish meal or flour is almost completely undeveloped. The domestic market for fishery products is limited and the per capita consumption per year is only 6.6 pounds as compared to about 240 pounds of meat.

The fishing industry in Uruguay is divided into Government and private enterprises. In 1957, the Government produced 25 percent of the total Uruguayan production with unit costs twice as great as private enterprise. Since 1957, the Government enterprise's proportion has steadily decreased to 9 percent in 1961. Efforts are now being made to increase the efficiency and productivity of the Government fishery unit. The Government, the University of the Republic, and the Ministry of National Defense have set up a joint work group to study and evaluate fishery resources. (United States Embassy, Montevideo, September 7, 1963.)



## Venezuela

## JOINT JAPANESE-VENEZUELAN TUNA-PROCESSING AND FREEZING VENTURE PLANNED:

According to an official of the Export-Import Bank of Japan, an agreement has been reached between a consortium of Japanese fishing companies and a group of Venezuelan industrialists for the formation of a jointly-owned company, 50 percent subscribed by Japanese interests and 50 percent by Venezuelan interests. Capitalization of the company is to be Bs 4 million (US\$881,000) and the registration was to be made formally on October 11, 1963.

The jointly-owned company will construct near Guiria on the Paria Peninsula in eastern Venezuela a fish cleaning and freezing plant with facilities to convert the fish waste into fish meal at a total cost of approximately Bs 3-1/2 million (\$771,000). In connection with this investment, the Export-Import Bank of Japan will loan Bs 6 million (\$1,322,000) to the corporation for the construction of dock facilities.

The cleaning and freezing plant will process tuna and will have a daily capacity of 450 metric tons of processed fish plus 250 to 300 metric tons of fish meal made from the waste. Construction of the plant was to begin at the end of October, 1963 and should be completed 14 months later or in December 1964 if the construction schedule is followed. The plant will employ approximately 600 workers when in full production.

All of the fish processed will be supplied on contract by Japanese fishing vessels operating in Atlantic waters at a

**Venezuela (Contd.):**

considerable distance from Venezuela. The fishing operations will not be carried on by the corporation. The vessels will not be of Venezuelan registry and as the catch will come from outside territorial waters, a duty of Bs 2,00 per kilogram (about 10 U.S. cents a pound) would be due on the fish landed in Venezuela.

However, special arrangements have been made with the Venezuelan Government whereby none of the fish or fish meal will be sold by the corporation for consumption within Venezuela and the Venezuelan Government will waive the duty.

A group of Japanese experts has made a study of the waters of the Gulf of Paria and of those off the Territory Delta Amacuro including those of the delta of the Orinoco River, all of which are presently comparatively unexploited. It was the conclusion of the Japanese experts that these waters have ample resources to supply a fish meal industry and a shrimp processing plant. Therefore, if the tuna cleaning and freezing plant is successful, the corporation plans to enlarge the facilities in 1965 at an approximate cost of Bs 2-1/2 million (\$551,000) so as to include both a fish meal and a shrimp processing plant. (United States Embassy, Caracas, September 26, 1963.)

Note: Bolivares converted at official free market rate of 4.54 bolivares equal US\$1.

**Viet-Nam****MECHANIZATION OF FISHING FLEET:**

There were 5,247 powered fishing craft in Viet-Nam at the end of August 1963, according to a census by the Fisheries Directorate's provincial representatives. At the end of 1962, the Fisheries Directorate reported only 3,600 motorized fishing vessels, based on estimates which were understated. Non-motorized fishing craft number 36,749. About 45 percent of the motorized vessels are in the important fishing communities of Phuoc Tuy, Binh Tuy, and Binh Thuan Provinces.

Motorization of the fishing fleet began in 1957 and has been one of the main reasons for a substantial increase in Viet-Nam's

commercial fish catch. (United States Embassy, Saigon, September 26, 1963.)

**Zanzibar****FISHERIES DEVELOPMENT:**

The Government of Zanzibar is the controlling stockholder in the Zanzibar Fisheries Development Co., which was formed to exploit the sardine and tuna resources off the East African Coast and to develop curing, cold storage, and processing facilities.

Zanzibar is centrally located on a large area of water which is protected throughout both monsoon periods. Trials conducted off Zanzibar over the past 18 months have shown that sardines can be caught in commercial quantities throughout the year by purse-seine vessels fishing at night with lights. The 2 fishing craft operated by the Zanzibar Fisheries Development Company can catch between 100 to 150 metric tons of sardines per lunar period. The company is now building a purse-seine vessel to explore tuna stocks.

The Company has completed a curing house with a capacity of 5 tons of sardines per day. Machinery has been ordered for a cold-storage plant with a capacity of 60 tons which should be in operation early in 1964.

The Company is cooperating closely with the East African Marine Fisheries Research Organization which is making a study of pelagic fish off the East African Coast in order to determine their potential for commercial fishing. (United States Consul, Zanzibar, September 8, 1963.)

**FISH CURING METHODS**

"Fish curing comprises all methods of preservation except refrigeration and canning. It includes (1) the drying, smoking, salting, and pickling of fish, (2) various combinations of these methods, and (3) miscellaneous methods such as the use of vinegar and fermentation processes or ripening."

--Principles and Methods in the Canning of Fishery Products,  
Research Report No. 18 (page 1).

## Foreign Fisheries Briefs

### CUBAN FISHERIES CENTER UNDER CONSTRUCTION WITH SOVIET AID:

A Cuban fishing port is under construction, with Soviet technical and economic aid, in Atarás Cove in Havana Bay. A total area of about 25 acres is involved. Included in the facilities will be docks, a shipyard, a cold-storage plant, canneries, warehouses, and a fish-reduction plant. Large warehouses have already been built for the storage of construction materials and supplies. About 2,000 workers will be occupied during construction; five major buildings and a dock area of  $2\frac{1}{2}$  acres on concrete piles are being built. The cold-storage plant will be about 825 feet long and about 200 feet wide with a storage capacity of 10,000 tons. The port will be equipped with radio, telephone, the latest indoor and outdoor lighting facilities, radar, and television.

The agreement for the construction of the Soviet-Cuban financed fishing port was announced on September 25, 1962, by Cuban radio and television which broadcast the signing ceremony between the Cuban Premier and Soviet Fisheries Minister. The \$12 million cost of the port will be shared equally by the Soviet Union and Cuba. Earlier on August 5, 1962, a Soviet-Cuban fisheries agreement was signed in Havana providing for Soviet aid to develop a Cuban commercial fishing industry. As a result of the August agreement, the Soviets sent 5 or 6 trawlers to Cuba on a loan basis for a year.

The fishing port in Havana Bay, in addition to serving Cuban needs, is expected to facilitate fishing operations of the Soviet fleet in the Western Atlantic Ocean for an agreed-upon period of 10 years. It has been estimated that about 30 Soviet fishing vessels have thus far been operating out of Cuban ports.

### CUBA PROMOTING CONSUMPTION OF FISH:

The Cuban Government is conducting an advertising campaign to persuade Cubans to eat merluza (assumed to be whiting), which is being landed by Soviet fishing vessels. It was reported that shellfish have always been popular in Cuba, but finfish were seldom eaten. Fish were removed from the Cuban

list of rationed items on June 3, 1963, and the Government planned to increase Cuban consumption of fishery products by 220 percent this year. (*Fish Trades Gazette*, London, August 10, 1963.)

### SOVIETS FIND NEW FISHING GROUNDS IN INDIAN OCEAN:

Soviet fishermen are reported to have found a "new fishing ground" in the southern Indian Ocean where they have located large resources of pelagic fish. In the Gulf of Aden, exploratory fishing is under way with "new equipment." (Unpublished sources.)

### SOVIET FISHING FLEET IN NORTHWEST ATLANTIC, AUGUST-SEPTEMBER 1963:

Until August 1963, the Soviet fishing fleet on and near Georges Bank in the Northwest Atlantic Ocean was estimated to have numbered about 200 vessels. The fleet size in the area remained fairly constant during the summer, although there was a rotation of vessels. In September, the number of Soviet vessels in the area was reduced to about 100. (Unpublished sources.)

### SOVIET FISHING EFFORT DECLINES IN EASTERN NORTH PACIFIC AND BERING SEA:

Beginning in early June 1963 and continuing through July, the Soviet fishing effort in the eastern North Pacific Ocean and Bering Sea remained fairly constant, comprising a fleet of about 200 vessels. In early August, the size of the Soviet fleet in the area began to decrease. Although the major effort still continued to be trawling for ocean perch in the Gulf of Alaska, the Soviet fleet in the eastern North Pacific and Bering Sea had been reduced to about 65 vessels by early September. Many of the vessels which had left the area are reported fishing for herring and saury off the coasts of Siberia and the Kuril Islands. (Unpublished sources.)

### SOVIET SAURY FISHING VESSELS TESTING FLUORESCENT LIGHTS:

This year (1963), Soviet saury fishing vessels from Sakhalin are being equipped with fluorescent lamps for night fishing. The new lamps consume considerably less electric current than the older incandescent lamps. Experiments are continuing on the use of the new lamps. (Unpublished sources.)

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## Foreign Fisheries Briefs (Contd.):

## SOVIETS TEST NEW METHOD FOR OPERATING LARGE FREEZER TRAWLERS:

A large freezer stern trawler is now operating out of Vladivostok in what the Soviets call the "voyage method." First adopted during 1963, the stern trawler remains at sea for 90 to 95 days including the round trip from port to the fishing grounds. Between trips the vessel remains in port 10 to 12 days. The vessel processes its entire catch and the Soviets claim that a tremendous increase in productivity has been achieved. Under the old method of operations, the large freezer trawlers, which were at sea for long periods, transferred the catch to cargo vessels at sea. (Unpublished sources.)

## SOVIET WHALING FLEET PREPARING FOR ANTARCTIC SEASON:

In September 1963, two Soviet whaling factoryships, the Sovetskaya Ukraina and the Slava, both with decks equipped to handle helicopters, were being readied for a joint Antarctic whaling expedition. In addition to the modern factoryships, the fleet will include 30 whale catcher boats, a scientific research vessel, and support ships. The Soviets have stated that their whaling fleet will also conduct research on the fishery resources of the Antarctic. (Unpublished sources.)

Notes: (1) These briefs were abstracted and compiled by the U.S. Bureau of Commercial Fisheries, Branch of Foreign Fisheries and Trade.

(2) See Commercial Fisheries Review, September 1963 p. 97; August 1963 p. 112.



**THE ROLE OF THE FISH AND WILDLIFE SERVICE**

A major problem facing the nation is adjusting its fish and wildlife resources to the changing combinations and conditions of land and water and in meeting the challenge of developing the food potential of the lakes and oceans.

To that task the Fish and Wildlife Service is dedicated. The degree of its success in that important undertaking is the measure of its contribution to the cause of conservation.

Science helps us perpetuate our fish and wildlife.

Helping adjust fisheries and wildlife resources to food and recreational needs of the Nation is the task of the Fish and Wildlife Service

**FISH AND WILDLIFE SERVICE**  
**U. S. DEPARTMENT OF THE INTERIOR**

# FEDERAL ACTIONS

## Department of Commerce

### COAST AND GEODETIC SURVEY

#### RESEARCH OCEANOGRAPHER APPOINTED:

Dr. Robert S. Dietz, internationally known scientist and author, has been appointed as a research oceanographer for the Coast and Geodetic Survey, U. S. Department of Commerce, the Director of the Survey, announced on September 22, 1963.



Dr. Robert S. Dietz

Dietz is the author of more than 100 scientific papers on oceanography and marine geology. He participated in the United States development of the Piccard bathyscaphe, the *Trieste*, which de-

cended in 1960 to a record depth of seven miles in the Marianas Trench of the Pacific.

The Director said one of Dietz' initial assignments will be to represent the United States in deep sea studies to be undertaken by a joint United States-Japanese Committee established by President Kennedy and the Prime Minister of Japan. Dietz spent a year at Tokyo University in 1953 as a Fulbright scholar. His knowledge of Japanese and oceanography make him peculiarly well qualified for this task.

The appointment "is part of our effort to carry out the increasing responsibilities of the Coast and Geodetic Survey in such important fields as oceanography, seismology, geodesy, and cartography," the Director stated.

Dietz is a graduate of the University of Illinois with BS, MS, PhD degrees. Most of his graduate work was done at Scripps Institution of Oceanography at La Jolla.



## Department of Defense

### ARMY CORPS OF ENGINEERS

#### PROPOSED REVISION OF FEDERAL REGULATIONS CONCERNING OPERATION OF DRAWBRIDGES ON ATLANTIC AND GULF COASTS:

Public notice of a proposed modification of the existing Federal Regulations governing the operation of drawbridges was issued by the U. S. Army Corps of Engineers on September 24, 1963.

Section 203.240 of Title 33 of the Code of Federal Regulations prescribes regulations for the operation of drawbridges crossing navigable waters discharging into the Atlantic Ocean south of and including Chesapeake Bay, and into the Gulf of Mexico (including the Lower Atchafalaya River, La.), except the Mississippi River and its tributaries and outlets. It is proposed to amend the existing regulations by the addition of the following paragraph:

"j. (1) Drawbridges shall not be required to open for craft carrying appurtenances unessential to navigation and any vessel operator who causes a bridge to be opened in order to clear appurtenances unessential for navigation shall be considered in violation of the regulations of this section.

(2) Appurtenances unessential for navigation shall include but not be

be limited to fishing outriggers, radio or television antennae, false stacks, and masts purely for ornamental purposes. Appurtenances unessential to navigation will not include flying bridges, sailboat masts, pile driver leads, spud frames on hydraulic dredges, or other items of equipment clearly necessary to the intended use of the vessel.

(3) Owners of drawbridges shall report to the proper District Engineer the names of any vessels requiring bridge openings considered to be in violation of this section. The District Engineer may at any time cause an inspection to be made of any craft utilizing the above-captioned navigable waters and is empowered to decide in each case whether or not the appurtenances are unessential to navigation. If the District Engineer decides a vessel has appurtenances unessential to navigation, he shall notify the vessel owner of his decision, specifying a reasonable time for making necessary alterations. If the vessel owner is aggrieved by the decision of the District Engineer, he may within 30 days after receipt of the request to perform necessary alterations, appeal the decision to the District Engineer in writing. After receipt by the District Engineer, the appeal will be forwarded through channels to the Secretary of the Army. If the Secretary of the Army rules that an appurtenance is unessential to navigation, the District Engineer shall again specify to the vessel owner a reasonable time for making necessary alterations to the appurtenance, and after the expiration of the time specified, any operation of the vessel on the above-captioned navigable waters in such a manner as to require drawbridge openings shall be deemed in violation of the regulations of this section, unless the necessary alterations shall have been made."

Regulations identical to the above have been in effect since 1957 on that portion of the Atlantic Intracoastal Waterway between

the Virginia-North Carolina boundary and Key West, Fla., and on that section of the Gulf Intracoastal Waterway from Rigolets, La., to Apalachee Bay, Fla., and tributaries thereto. The proposed additional regulations, if adopted, would not leave it to the judgment of a bridgetender as to whether or not a bridge would be opened. Bridgetenders would still be required to open a bridge upon receipt of proper signal from an approaching vessel if the bridge was otherwise required to be opened at the time. The regulations would merely provide a means by which boat owners could be required to alter their vessels in such way as to eliminate the necessity of bridge openings brought about entirely by appurtenances which have been determined to be unessential to navigation. The Army Corps of Engineers did not plan to hold a public hearing for consideration of the proposed amendment to the bridge regulations. Interested persons were given until October 25, 1963, to submit comments and such comments were to be given the same weight as if developed in a public hearing.



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### USE OF CALCIUM DISODIUM EDTA PERMITTED AS A COLOR RETENTION ADDITIVE IN CANNED CLAMS:

The food additive calcium disodium EDTA to promote color retention in canned cooked clams may be safely used under certain conditions. The amendment to the food additive regulations providing for this change as published by the Food and Drug Administration in the September 25, 1963, Federal Register follows:

#### PART 121—FOOD ADDITIVES

##### Subpart D—Food Additives Permitted in Food for Human Consumption

CALCIUM DISODIUM EDTA (CALCIUM DISODIUM ETHYLENEDIAMINETETRAACETATE; CALCIUM DISODIUM (ETHYLENEDIIMINO) TETRAACETATE)

The Commissioner of Food and Drugs, having evaluated data in a petition filed by Geigy Chemical Corporation, Saw Mill River Road, Ardsley, New York, and other relevant material, has concluded that an amendment to § 121.1017 should

issue to prescribe the conditions of use of the additive as a stabilizer of the color of canned clams. Therefore, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (sec 409 (c) (1), 72 Stat. 1786; 21 U.S.C. 348(c) (1)), and under the authority delegated to the Commissioner by the Secretary of Health, Education, and Welfare (25 F.R. 8625), § 121.1017 *Calcium disodium EDTA* \* \* \* is amended by inserting in paragraph (b) (1), immediately preceding "Crabmeat (cooked canned)," a new item reading as follows:

Food	Limitation (parts per million)	Use
Clams (cooked canned). *	340	Promote color retention.

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the **FEDERAL REGISTER** file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing. A hearing will be granted if the objections are supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

**Effective date.** This order shall be effective on the date of its publication in the **FEDERAL REGISTER**.

(Sec. 409(c) (1), 72 Stat. 1786; 21 U.S.C. 348 (c) (1))

Dated: September 18, 1963.

GEO. P. LARRICK,  
Commissioner of Food and Drugs.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### ASSISTANT DIRECTOR FOR NATIONAL FISHERIES CENTER APPOINTED:

The appointment of William Hagen, Jr., as Assistant Director of the new National Fisheries Center and Aquarium to be built in Washington, D. C., was announced on September 26, 1963, by Secretary of the Interior Stewart L. Udall. Hagen, former Chief of the Branch of Fish Hatcheries in the U. S. Bureau of Sport Fisheries and Wildlife, also will serve as Acting Director of the Center.

The new National Fisheries Center and Aquarium, which is to be constructed on Hains Point in the Nation's capital, will be one of the largest and most complete installations in the world for exhibiting and studying aquatic life. Construction and operating costs of the new \$10-million center will be

repaid by a small admission charge. More than 1,000 species of fish, amphibians, and invertebrates will be displayed in natural surroundings which will include indoor and outdoor pools. There will be a trout stream, a bayou for bass, and especially designed tanks for tropical fish.

The Fisheries Center will have facilities and specimens to aid aquatic research in such varied fields as marine fish diseases, behavior of aquatic organisms, nutrition of fish, and medical values of antibiotics produced by marine animals.

In his new position, Hagen will work on the preliminary planning and design for the National Fisheries Center and Aquarium.



## Treasury Department

### INTERNAL REVENUE SERVICE

#### FISHERMEN'S ESTIMATED INCOME TAX:

Notice of proposed rule making having been published by the Internal Revenue Service in the **Federal Register**, July 2, 1963, and no objection to the rules proposed having been received, regulations as proposed were adopted September 25, 1963, to extend to fishermen the same treatment accorded farmers in relation to estimated income tax. The regulations consist of amendments to the Income Tax Regulations (26 CFR Part 1) in order to conform the regulations to changes made by **Public Law 87-682** approved September 25, 1962.

The amendments as published in the **Federal Register**, October 1, 1963, follow:

**PART I—INCOME TAX; TAXABLE YEARS BEGINNING AFTER DECEMBER 31, 1953**

**Extension to Fishermen of Same Treatment Accorded Farmers in Relation to Estimated Tax**

In order to conform the Income Tax Regulations (26 CFR Part 1) under sections 6015(f), 6073, 6153, and 6654 of the Internal Revenue Code of 1954 to the Act of September 25, 1962 (Public Law 87-682, 76 Stat. 575), such regulations are amended as follows:

**PARAGRAPH 1. Section 1.6015(f)** is amended by revising subsection (f) of section 6015 and the historical note to read as follows:

**§ 1.6015(f) Statutory provisions; declaration of estimated income tax by individuals; return as declaration or amendment.**

**Sec. 6015. Declaration of estimated income tax by individuals.** \*\*

(1) **Return as declaration or amendment.** If on or before January 31 (or February 15, in the case of an individual referred to in section 6073(b), relating to income from farming or fishing) of the succeeding taxable year the taxpayer files a return, for the taxable year for which the declaration is required, and pays in full the amount computed on the return as payable, then, under regulations prescribed by the Secretary or his delegate—

(1) If the declaration is not required to be filed during the taxable year, but is required to be filed on or before January 15, such return shall be considered as such declaration; and

(2) If the tax shown on the return (reduced by the sum of the credits against tax provided by part IV of subchapter A of chapter 1) is greater than the estimated tax shown in a declaration previously made, or in the amendment thereto, such return shall be considered as the amendment of the declaration permitted by subsection (e) to be filed on or before January 15.

In the application of this subsection in the case of a taxable year beginning on any date other than January 1, there shall be substituted, for the 15th or last day of the months specified in this subsection, the 15th or last day of the months which correspond thereto.

[Sec. 6015(f) as amended by sec. 74, Technical Amendments Act 1968 (T2 Stat. 1660); sec. 1(a)(1), Act of Sept. 25, 1962 (Pub. Law 87-682, 76 Stat. 575)]

**PAR. 2. Section 1.6015(f)-1** is amended by revising subparagraph (1) of paragraph (a) to read as follows:

**§ 1.6015(f)-1 Return as declaration or amendment.**

(a) **Time for filing return.** (1) If the taxpayer files his return for the calendar year on or before January 31 (or February 15, in the case of an individual referred to in section 6073(b), relating to income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing) of the succeeding calendar year (or if the taxpayer is on a fiscal year basis, on or before the last day of the first month (in the case of a farmer or, with respect to taxable years beginning after December 31, 1962, a fisherman, the 15th day of the second month) immediately succeeding the close

of such fiscal year), and pays in full the amount computed on the return as payable, then—

(i) If the declaration is not required to be filed during the taxable year, but is required to be filed on or before January 15 of the succeeding year (or the date corresponding thereto in the case of a fiscal year), such return shall be considered as such declaration; or

(ii) If a declaration was filed during the taxable year, such return shall be considered as the amendment of the declaration permitted by section 6015(e) to be filed on or before January 15 of the succeeding year (or the date corresponding thereto in the case of a fiscal year). Hence, for example, an individual taxpayer on a calendar year basis who, subsequent to September 1, 1963, first meets the requirements of section 6015(a) which necessitate the filing of a declaration for 1963, may satisfy the requirements as to the filing of such declaration by filing his return for 1963 on or before January 31, 1964 (February 15, 1964, in the case of a farmer or fisherman), and paying in full at the time of such filing the tax shown thereon to be payable. Likewise, if a taxpayer files on or before September 15, 1963, a timely declaration for such year and subsequent thereto and on or before January 31, 1964, files his return for 1963, and pays at the time of such filing the tax shown by the return to be payable, such return shall be treated as an amended declaration timely filed.

**PAR. 3. Section 1.6073** is amended by revising subsections (a) and (b) of section 6073 and by adding a historical note. The amended provisions read as follows:

**§ 1.6073 Statutory provisions; time for filing declarations of estimated income tax by individuals.**

**Sec. 6073. Time for filing declarations of estimated income tax by individuals—(a) Individuals other than farmers or fishermen.** Declarations of estimated tax required by section 6015 from individuals regarded as neither farmers nor fishermen for the purpose of that section shall be filed on or before April 15 of the taxable year, except that if the requirements of section 6015 are first met—

(1) After April 1 and before June 2 of the taxable year, the declaration shall be filed on or before June 15 of the taxable year, or

(2) After June 1 and before September 2 of the taxable year, the declaration shall be filed on or before September 15 of the taxable year, or

(3) After September 1 of the taxable year, the declaration shall be filed on or before January 15 of the succeeding taxable year.

(b) **Farmers or fishermen.** Declarations of estimated tax required by section 6015 from individuals whose estimated gross income from farming or fishing (including oyster farming) for the taxable year is at least two-thirds of the total estimated gross income from all sources for the taxable year may, in lieu of the time prescribed in subsection (a), be filed at any time on or before January 15 of the succeeding taxable year.

[Sec. 6073 as amended by secs. 1(a)(2), (b), (c), Act of Sept. 25, 1962 (Pub. Law 87-682, 76 Stat. 575)]

**PAR. 4. Section 1.6073-1** is amended by revising paragraphs (a), (b), and (d) to read as follows:

**§ 1.6073-1 Time and place for filing declarations of estimated income tax by individuals.**

(a) **Individuals other than farmers or fishermen.** Declarations of estimated tax for the calendar year shall be made on or before April 15th of such calendar year by every individual whose anticipated income for the year meets the requirements of section 6015(a). If, however, the requirements necessitating the filing of the declaration are first met, in the case of an individual on the calendar year basis, after April 1st, but before June 2d of the calendar year, the declaration must be filed on or before June 15th; if such requirements are first met after June 1st and before September 2d, the declaration must be filed on or before September 15th; and if such requirements are first met after September 1st, the declaration must be filed on or before January 15th of the succeeding calendar year. In the case of an individual on the fiscal year basis, see § 1.6073-2.

(b) **Farmers or fishermen—(1) In general.** In the case of an individual on a calendar year basis, whose estimated gross income from farming (including oyster farming) or, with respect to taxable years beginning after December 31, 1962, from fishing for the calendar year is at least two-thirds of his total estimated gross income from all sources for such year, his declaration may be filed on or before the 15th day of January of the succeeding calendar year in lieu of the time prescribed in paragraph (a) of this section. For the filing of a return in lieu of a declaration, see paragraph (a) of § 1.6015(f)-1.

(2) **Farmers.** The estimated gross income from farming is the estimated income resulting from oyster farming, the cultivation of the soil, the raising or harvesting of any agricultural or horticultural commodities, and the raising of livestock, bees, or poultry. In other words, the requisite gross income must be derived from the operations of a stock, dairy, poultry, fruit, or truck farm, or plantation, ranch, nursery, range, orchard, or oyster bed. If an individual receives for the use of his land income in the form of a share of the crops produced thereon such income is from farming. As to determination of income of farmers, see sections 61 and 162 and the regulations thereunder.

(3) **Fishermen.** The estimated gross income from fishing is the estimated income resulting from the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish (for example, clams and mussels), crustaceans (for example, lobsters, crabs, and shrimps), sponges, seaweeds, or other aquatic forms of animal and vegetable life. The estimated gross income from fishing includes the income expected to be received by an officer or member of the crew of a vessel while the vessel is engaged in any such activity, whether or not the officer or member of the crew is himself so engaged, and, in the case of an individual who is engaged in any such activity in the employ of any person, the

income expected to be received by such individual from such employment. In addition, income expected to be received for services performed as an ordinary incident to any such activity is estimated gross income from fishing. Similarly, for example, the estimated gross income from fishing includes income expected to be received from the shore services of an officer or member of the crew of a vessel engaged in any such activity, if such services are an ordinary incident to any such activity. Services performed as an ordinary incident to such activities include, for example, services performed in such cleaning, icing, and packing of fish as are necessary for the immediate preservation of the catch.

(d) *Amendment of declaration.* An amended declaration of estimated tax may be filed during any interval between installment dates prescribed for the taxable year. However, no amended declaration may be filed until after the installment date on or before which the original declaration was filed and only one amended declaration may be filed during each interval between installment dates. An amended declaration shall be filed with the district director with whom the original declaration was filed.

PAR. 5. Section 1.6073-2 is amended to read as follows:

**§ 1.6073-2 Fiscal years.**

(a) *Individuals other than farmers or fishermen.* In the case of an individual on the fiscal year basis, the declaration must be filed on or before the 15th day of the 4th month of the taxable year. If, however, the requirements of section 6015(a) are first met after the 1st day of the 4th month and before the 2d day of the 6th month, the declaration must be filed on or before the 15th day of the 6th month of the taxable year. If such requirements are first met after the 1st day of the 9th month, the declaration must be filed on or before the 15th day of the 1st month of the succeeding fiscal year. Thus, if an individual taxpayer has a fiscal year ending on June 30, 1956, his declaration must be filed on or before October 15, 1955, if the requirements of section 6015(a) are met on or before October 1, 1955. If, however, such requirements are not met until after October 1, 1955, and before December 2, 1955, the declaration need not be filed until December 15, 1955.

(b) *Farmers or fishermen.* An individual on the fiscal year basis whose estimated gross income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing (as defined in paragraph (b) of § 1.6073-1) is at least two-thirds of his total estimated gross income from all sources for such taxable year may file his declaration on or before the 15th day of the month immediately following the close of his taxable year.

PAR. 6. Section 1.6073-3 is amended to read as follows:

**§ 1.6073-3 Short taxable years.**

(a) *Individuals other than farmers or fishermen.* In the case of short taxable years the declaration shall be filed on or before the 15th day of the 4th month of such taxable year if the requirements of section 6015(a) are met on or before the 1st day of the 4th month of such year. If such requirements are first met after the 1st day of the 4th month but before the 2d day of the 6th month, the declaration must be filed on or before the 15th day of the 6th month. If such requirements are first met after the 1st day of the 6th month but before the 2d day of the 9th month, the declaration must be filed on or before the 15th day of the 9th month. If, however, the period for which the declaration is filed is one of 4 months, or one of 6 months and the requirements of section 6015(a) are not met until after the 1st day of the 4th month, or one of 9 months and such requirements are not met until after the 1st day of the 6th month, the declaration may be filed on or before the 15th day of the succeeding taxable year.

(b) *Farmers or fishermen.* In the case of an individual whose estimated gross income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing (as defined in paragraph (b) of § 1.6073-1) for a short taxable year is at least two-thirds of his total estimated gross income from all sources for such taxable year, his declaration may be filed on or before the 15th day of the month immediately following the close of such taxable year.

PAR. 7. Section 1.6153 is amended by revising subsection (b) of section 6153 and by adding a historical note. The amended provision reads as follows:

**§ 1.6153 Statutory provisions; installment payments of estimated income tax by individuals.**

Sec. 6153. *Installment payments of estimated income tax by individuals.*

(b) *Farmers or fishermen.* If an individual referred to in section 6073(b) (relating to income from farming or fishing) makes a declaration of estimated tax after September 15 of the taxable year and on or before January 15 of the succeeding taxable year, the estimated tax shall be paid in full at the time of the filing of the declaration.

[Sec. 6153 as amended by sec. 1 (a) (3), (c), Act of Sept. 25, 1962 (Pub. Law 87-682, 76 Stat. 575)]

PAR. 8. Section 1.6153-1 is amended by revising paragraph (b) to read as follows:

**§ 1.6153-1 Payment of estimated tax by individuals.**

(b) *Farmers or fishermen.* Special provisions are made with respect to the filing of the declaration and the payment of the tax by an individual whose estimated gross income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing is at least two-thirds of his total gross income from all sources for the taxable year. As to what constitutes income from farming or fishing within the meaning of this paragraph, see paragraph (b) of § 1.6073-1. The declaration of such an individual may be filed on or

before January 15 of the succeeding taxable year in lieu of the time prescribed for individuals generally. Where such an individual makes a declaration of estimated tax after September 15 of the taxable year, the estimated tax shall be paid in full at the time of the filing of the declaration.

PAR. 9. Section 1.6654 is amended by revising subsection (b) (1) of section 6654 and so much of subparagraph (C) of subsection (d) (1) of section 6654 as precedes clause (1), and by adding a historical note. The amended provisions read as follows:

**§ 1.6654 Statutory provisions; failure by individual to pay estimated income tax.**

Sec. 6654. *Failure by individual to pay estimated income tax.*

(b) *Amount of underpayment.* (1) The amount of the installment which would be required to be paid if the estimated tax were equal to 70 percent (66 2/3 percent in the case of individuals referred to in section 6073(b), relating to income from farming or fishing) of the tax shown on the return for the taxable year or, if no return was filed, 70 percent (66 2/3 percent in the case of individuals referred to in section 6073(b) relating to income from farming or fishing) of the tax for such year, over

**(d) Exception.**

(1) (C) An amount equal to 70 percent (66 2/3 percent in the case of individuals referred to in section 6073(b), relating to income from farming or fishing) of the tax for the taxable year computed by placing on an annualized basis the taxable income for the months in the taxable year ending before the month in which the installment is required to be paid. For purposes of this subparagraph, the taxable income shall be placed on an annualized basis by—

[Sec. 6654 as amended by sec. 1(a)(4), Act of Sept. 25, 1962 (Pub. Law 87-682, 76 Stat. 575)]

PAR. 10. Section 1.6654-1 is amended by revising subparagraph (1) (i) of paragraph (s) and Example (1) in paragraph (c) to read as follows:

**§ 1.6654-1 Addition to the tax in the case of an individual.**

(a) *In general.* (1) (i) 70 percent (66 2/3 percent in the case of individuals referred to in section 6073(b), relating to income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing) of the tax shown on the return for the taxable year or, if no return was filed, 70 percent (66 2/3 percent in the case of individuals referred to in section 6073(b), relating to income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing) of the tax for such year, divided by the number of installment dates prescribed for such taxable year, over

**(c) Examples.**

Example (1). An individual taxpayer files his return for the calendar year 1955 on April 15, 1956, showing a tax of \$40,000. He has paid a total of \$20,000 of estimated tax in four equal installments of \$5,000 on each of the four installment dates prescribed for such year. No other payments were made prior to the date the return was filed. Since the amount of each installment paid by the

last date prescribed for payment thereof is less than one-quarter of 70 percent of the tax shown on the return, the addition to the tax is applicable in respect of the underpayment existing as of each installment date and is computed as follows:

(1) Amount of tax shown on return.....	\$40,000
(2) 70 percent of item (1).....	28,000
(3) One-fourth of item (2).....	7,000
(4) Deduct amount paid on each installment date.....	5,000
(5) Amount of underpayment for each installment date (item (3) minus item (4)).....	2,000
(6) Addition to the tax:	
1st installment—period 4— 15-55 to 4-15-56.....	\$120
2d installment—period 6— 15-55 to 4-15-56.....	100
3d installment—period 9— 15-55 to 4-15-56.....	70
4th installment—period 1— 15-56 to 4-15-56.....	30
Total.....	390

PAR. 11. Section 1.6654-2 is amended by revising so much of subparagraph (3) of paragraph (a) as precedes subdivision (i). This amended provision reads as follows:

**§ 1.6654-2 Exceptions to imposition of the addition to the tax in the case of individuals.**

*(a) In general. . . .*

(3) The amount which would have been required to be paid on or before the date prescribed for payment if the estimated tax were an amount equal to 70 percent (66% percent in the case of individuals referred to in section 6073(b), relating to income from farming or, with respect to taxable years beginning after December 31, 1962, from fishing) of the tax computed by placing on an annual basis the taxable income for the calendar months in the taxable year preceding such date. The taxable income shall be placed on an annual basis by—

Note: See Commercial Fisheries Review, Sept. 1963 p. 108.



## **Eighty-Eighth Congress**

### **(First Session)**

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent leg-



islative actions by the House and Senate, as well as signature into law or other final disposition are covered.

**ANTIDUMPING ACT AMENDMENT:** S. 2241 (Allott & Dominick) introduced in Senate Oct. 16, 1963, to amend section 201 of the Antidumping Act, 1921, with respect to the determination of injury or threatened injury to an industry in the United States; referred to Committee on Finance. Similar to other bills previously introduced in Senate. Would require that imports of the same item from several different foreign countries be aggregated in measuring the injury to domestic industry and that under this bill an injury to domestic industry is conclusively presumed where dumping is found to exist and where imports have accounted for more than 10 percent, but less than 90 percent, of our total consumption of the article in the preceding 12 months.

**CLAM PLANTERS DISASTER LOANS:** H. R. 8726 (Lennon) introduced in House October 7, 1963, to extend to clam planters the benefits of the provisions of the present law which provide for production disaster loans for farmers, stockmen, and oyster planters; referred to the Committee on Agriculture. Similar or identical to another bill previously introduced in the House.

**COLLISION AT SEA, REGULATIONS FOR PREVENTION:** The President, on Sept. 24, 1963, signed into law (P. L. 88-131) the bill H. R. 6012, to authorize the President to proclaim regulations for preventing collision at sea. Would authorize the President, on behalf of the United States, to proclaim the international regulations for preventing collisions at sea, 1960, on or after a date fixed by the Intergovernmental Maritime Consultative Organization for application of such regulations by Governments which have agreed to accept them. Such regulations shall thereafter have effect as if enacted by statute, and be followed by all public and private vessels of the United States and by all aircraft of United States registry. However, they shall not apply to inland waters or any territorial waters of the United States. Would repeal the existing international rules for preventing collisions at sea, 1948. Regulations were formulated at the Fourth International Conference on Safety of Life at Sea, 1960 (annex E to the final act of the International Conference on Safety of Life at Sea). Parts of the rules of the International Regulations for preventing collisions at sea were rewritten. Those applying directly to fishing vessels are covered under Rules 9 and 13.

**COMMERCIAL FISHERIES FUND:** H. R. 8537 (Glenn) introduced in the House Sept. 24, 1963, to promote State commercial fishery research and development projects, and for other purposes; referred to Committee on Merchant Marine and Fisheries. Similar or identical to other bills previously introduced in the House.

**CONSERVATION OF MARINE FISHERIES RESOURCES:** On Sept. 12, 1963, the Senate Committee on Commerce, in executive session, ordered favorably to the Senate with amendments S. 1988, to prohibit fishing in territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States.

The Senate on Oct. 1, 1963, passed with amendments S. 1988, to prohibit fishing in the territorial waters of

the United States and in certain other areas by persons other than nationals of the United States. Bill declares that it is unlawful for foreign vessels to engage in the fisheries within the territorial waters of the United States and its territories and possessions and the Commonwealth of Puerto Rico or to engage in the taking of any fishery resource of the Continental Shelf which appertains to the United States, except as provided by an international agreement to which the United States is a party. Violators would be subject to a fine of not more than \$10,000 or imprisonment of not more than 1 year or both. Every vessel employed in any manner in connection with a violation of the Act shall be subject to forfeiture and all fish taken or retained or the monetary value thereof shall be forfeited. The responsibility for enforcement is to be shared by the Coast Guard, the Department of the Interior, the Bureau of Customs, and such State and territorial officers as the Secretary of the Interior may designate. Federal district courts are empowered to issue such warrants as may be required for the enforcement of the Act. Persons authorized to carry out enforcement activities are given the power to execute those warrants; to arrest, with or without a warrant, any person committing in their presence a violation of the Act; and, if as a result of such search they have reason to believe that such vessel or any person on board is in violation of the Act, then to arrest such person; to seize any vessel which has been used or which reasonably appears to have been used contrary to the provisions of the Act; and to seize, whenever and wherever lawfully found all fish taken or retained in violation of the Act. Provides for the seizure and disposal of fish taken in violation of the Act, and establishes procedures for setting of a bond by alleged violators. The Secretary of the Treasury would be authorized to issue such regulations as he determines necessary to carry out the provisions of the Act.

Senator Gruening (Alaska) on October 2, 1963, presented a statement to the Senate in support of his bill S. 1816, to conserve the offshore fishery resources of the United States and its territories, and for other purposes. Included in his statement were letters from the Governor of Alaska to the President of the United States and the Secretary of State protesting the Russian invasion of the waters off Kodiak Island. (Congressional Record, October 2, 1963, pages 17600-17602.)

Representative Rivers (Alaska) presented a statement to the House Oct. 15, 1963, concerning the exploitation of fishing grounds adjacent to the United States by fishing fleets of foreign nations. He urged the House to help resolve this problem by the passage of important and pertinent legislation before the House (either the Senate-passed S. 1988 or H. R. 7954). Representative Rivers also included in his statement a letter he wrote to the President of the United States. (Congressional Record, Oct. 15, 1963, page A6430.)

**EXEMPT TRANSPORTATION OF AGRICULTURAL AND FISHERY PRODUCTS:** The Surface Transportation Subcommittee of the Senate Committee on Commerce Sept. 30, 1963, resumed hearings on S. 1061, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes. The Subcommittee on Oct. 7, 1963, recessed the hearings subject to call.

See Transportation Bill for hearings held on H. R. 4700.

**FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: Labeling and Registration of Economic Poisons** (Hearing before a Subcommittee of the Committee on Agriculture and Forestry, United States Senate, 88th Congress, 1st Session), 40 pp., printed. Contains hearing held Sept. 10, 1963, on S. 1605, to amend the Federal Insecticide, Fungicide and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, to eliminate registration under protest, and for other purposes; contents of the bill; reports from various Federal agencies; statements of Federal and industry personnel; and statements filed by members of the Senate.

The Senate Committee on Agriculture and Forestry, in executive session, Oct. 16, 1963, ordered favorably reported with amendments S. 1605.

**FISHERY MARKETING ACT AMENDMENT: Fishermen's Marketing Act** (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Commerce, United States Senate, 88th Congress, 1st Session), 215 pp., printed. Contains hearings held May 8 and June 27, 1963, in Washington, D. C.; May 24, 1963, in San Pedro, California; and May 25, 1963, in San Diego, California, on S. 1135, to make clear that fishermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish and other aquatic products on which the livelihood of their members depends; reports of various Federal agencies; testimony given by various fishermen organizations, unions, institutes, and Federal agencies; and letters and correspondence submitted to the Committee.

**FISHING INDUSTRY PROBLEMS:** On Sept. 11, 1963, Senator Bartlett spoke in the Senate calling attention to problems of the United States fishing industry and some of the pending legislation (S. 1988, S. 1006, and S. 627) designed to assist the industry (Congressional Record, page 15899). A newspaper article discussing the need for such legislation was also inserted in the Congressional Record by the Senator.

The need of the United States fishing industry for assistance was also discussed on Sept. 11, 1963, under an extension of remarks by Congressman Keith (Congressional Record Appendix, pages A5743-5744) and Congressman Rogers (Congressional Record Appendix, page A5765).

An address by Senator Muskie on United States fishing industry problems and some of the pending legislation (S. 1988, S. 1816, S. 627, S. 1006, and H. R. 6997) designed to aid the industry, which was given before the sixth annual New England fish and seafood parade dinner held in Boston, Mass., was inserted in the Sept. 26, 1963, Congressional Record (page 17259) by Senator Kennedy.

**FISH PROTEIN CONCENTRATE:** Congressman Keith, on Sept. 17, 1963, addressed the House on the effects of the U. S. Food and Drug Administration ruling on Fish Protein Concentrate (Congressional Record, pages 16396-16397). He also had inserted in the Congressional Record a newspaper article on the same subject titled "FDA Bottleneck," which was published in the New Bedford (Mass.) Standard-Times, on Sept. 10, 1963.

**IMPORTATION OF FOODSTUFFS:** Senator Curtis, on Sept. 9, 1963, spoke in the Senate calling attention to the increased importation of foodstuffs by the United

States. In his remarks he included a tabulation of imports of foodstuffs for 1962, which included fishery products (Congressional Record, pages 15643-15644).

**INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES:** S. Res. 207 (Pell) introduced in the Senate Oct. 1, 1963, to urge the President to secure fuller enforcement of provisions of the International Convention for the Northwest Atlantic Fisheries; referred to Committee on Foreign Relations. Senator Pell (Rhode Island) stated, upon introduction of the resolution, that the objectives "... could be achieved by the adoption of a multilateral enforcement policy within the Northwest Convention, setting forth the provision that the enforcement arm of any signatory nation can board and inspect any fishing vessel within the prescribed waters. This could then serve as a guideline policy for other fishing conventions to which the United States are signatory." The Senator also stated that the Department of State should be urged "... to make every effort to secure one more country's ratification of the Geneva Convention of 1958 on the Continental Shelf. This convention would give the coastal State sovereign rights for the purpose of exploring and exploiting the natural resources of the Continental Shelf. Then, too, the shelf is defined in such a manner that little doubt would exist as to the rights granted therein to any coastal State. One more ratifying country would put this convention into effect, and thus could resolve our problems with respect to ocean resources in that area."

**INTERNATIONAL FISHERIES ORGANIZATIONS:** H. Doc. 131, United States Contributions to International Organizations (Letter from Acting Secretary of State transmitting the 11th report on the extent and disposition of United States contributions to international organizations for the fiscal year 1962, pursuant to Section 2 of Public Law 806, 81st Congress), 127 pp., illus., printed. It is the annual report presented to Congress on the United States contributions to International Organizations by the Secretary of State. Included are reports on the following international fisheries organizations: North Pacific Fur Seal Commission, Inter-American Tropical Tuna Commission, International North Pacific Fisheries Commission, and the International Commission for Northwest Atlantic Fisheries. It also contains charts showing the estimated contributions from 1946 to 1963.

**INTERNATIONAL NORTH PACIFIC FISHERIES PROBLEMS:** Oct. 11, 1963, Senator Gruening (Alaska) presented a statement to the Senate concerning the threat to our greatest national fish resource, the Pacific salmon by a new predator in the form of foreign fishing, namely Japan and the Soviet Union. Senator Gruening also included an article from the Seattle Post-Intelligencer titled "International Fisheries: The Problems Are Complex." (Congressional Record, Oct. 11, 1963, pages 18379-18380.)

**JAPANESE FISHERY EXPORTS TO THE UNITED STATES:** Pointing out the importance of the United States market to the Japanese fishing industry, Senator Bartlett, on Sept. 6, 1963, inserted in the Congressional Record (pages 15576-15577) a table showing the quantity and value of Japanese exports of fishery products to the United States in 1962. The table also compared the 1963 United States tariff rate on fishery products from Japan with that in effect July 1, 1934. Senator Bartlett states, in part, "It should be pointed out that this enormous value of fishery exports to the

United States came about in some degree because of the fact the duties imposed have been substantially reduced during recent years. . . ."

**MEDICAL CARE FOR VESSEL OWNERS:** The Subcommittee on Public Health and Safety of the House Committee on Interstate and Foreign Commerce held a hearing Oct. 14, 1963, on medical care for fishing boat owners. Testimony was given by members of Congress, officials of various Federal agencies and public witnesses.

**METRIC SYSTEM STUDY:** On Oct. 10, 1963, Senator Pell (Rhode Island) announced to the Senate the release by the White House of the first report of the Consumer Advisory Council which recommends, with other proposals, that a study be made by an appropriate executive department or agency of the desirability and practicability of conversion--by the United States--to the metric system. He noted that the Committee for the Study of the Metric System of the American Geophysical Union has done notable work in this field and included in the Congressional Record (pages 18207-18211) the progress report of the Committee and an address by the Committee's Chairman, titled "Why Adopt the Metric System?" Senator Pell stating that since the introduction of his bill S. 1278, to provide that the National Bureau of Standards shall conduct a program of investigations, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures, he has received support from various groups and individuals including several Federal agencies.

**NORTH PACIFIC FISHERIES CONVENTION:** Concerning the meeting in Tokyo, Japan, on Sept. 16, 1963, of the Parties to the International Convention for the High Seas Fisheries of the North Pacific Ocean, Senator Bartlett addressed the Senate on Sept. 12, 1963, on the principle of abstention (Congressional Record, pages 15979-15980). A newspaper article on the subject was also inserted in the Congressional Record by the Senator.

On Sept. 13, 1963, Senator Mansfield, on behalf of Senator Gruening, inserted in the Congressional Record (page 16064) a resolution of the Ketchikan, Alaska, Chamber of Commerce, urging the Parties to the International Convention for the High Seas Fisheries of the North Pacific Ocean to renew the abstention principle at their meeting in Tokyo, Japan, on Sept. 16, 1963.

Congressman Pelly, on October 7, 1963, inserted in the Congressional Record Appendix (pages A6268-6269) a newspaper article discussing the principle of abstention.

**OCEANOGRAPHIC RESEARCH PROGRAM:** Congressman Hanna, on Sept. 9, 1963, under extended remarks in the Congressional Record Appendix (pages A5678-5679), discussed United States and Soviet efforts in the field of oceanography.

Congressman Hanna, on Sept. 17, 1963, under extended remarks in the Congressional Record Appendix (pages A5874-5875) discussed United States efforts and needs in the field of oceanography.

Congressman Hanna on October 8, 1963, inserted in the Congressional Record Appendix (page A6314) a letter from the Director of the U. S. Coast and Geodetic Survey outlining the work the Agency is doing in the field of oceanography.

Congressman Hanna (California) on Oct. 10, 1963, extended his remarks on the problems and programs of oceanography in the United States. He stated that since there were 15 separate agencies of the Government involved in the important work of this field, that the establishment of a joint committee in Congress which can act as the coordinating forum for the future oceanographic programs should be considered. He also inserted an article "Nation Launches 10-Year, \$2.3 Billion Scientific Study Into Ocean's Secrets," which appeared in a recent issue of Washington World. (Congressional Record, Oct. 11, 1963, pages A6387-A6388.)

**RUSSIAN FISHING VESSELS OFF UNITED STATES COASTS:** On September 5, 1963, Congressman Rogers addressed the House for one minute on the subject of Russian trawlers off United States coasts (Congressional Record, page 15513).

Senator Bartlett, on Sept. 9, 1963, addressed the Senate on the subject of Soviet fishing vessels off United States coasts (Congressional Record, pages 15683-15687). The Senator inserted in the Congressional Record (1) a U.S. Coast Guard report on the activities of Soviet vessels off Alaska on Aug. 28 and Sept. 8, 1963, and (2) a report from the U.S. Library of Congress on Soviet provisions for enforcing fishing regulations within their territorial waters.

Congressman Rogers, on Sept. 10, 1963, addressed the House for one minute on the subject of Russian trawlers off United States coasts (Congressional Record, pages 15832-15833).

Congressman Gibbons, on Sept. 12, 1963, addressed the House for one minute, pointing out steps taken by the United States Department of the Navy to keep more Soviet trawlers under closer surveillance when they are operating close to the United States coasts (Congressional Record, page 16035).

Senator Bartlett spoke from the floor of the Senate on Sept. 13, 1963, calling attention to the activities of Russian fishing vessels off Kodiak, Alaska, in an area where United States fishermen were conducting crab-fishing operations (Congressional Record, pages 16069-16070).

Senator McIntyre (New Hampshire) on Oct. 10, 1963, presented a statement to the Senate stating "... the farflung operations of Soviet fisheries reveal the vigor of their efforts to turn the riches of the seas to good account. Hopefully the increasing interest in new ship construction, commercial fisheries development, and oceanography in the United States will revive our own lagging interest in this vital resource." He also inserted in the Congressional Record (pages 18205-18206) an article "Soviet Fishing Watched," which appeared in a recent issue of the Christian Science Monitor.

**SHELLFISH INDUSTRY PROBLEMS:** The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held hearings Oct. 3 and 4, 1963, to consider problems of the shellfish industry. Testimony was heard from public witnesses.

Congressman Dingell, on October 7, 1963, inserted in the Congressional Record Appendix (pages A6276-6277) testimony presented to the Subcommittee on Fisheries and Wildlife Conservation of the House Com-

mittee on Merchant Marine and Fisheries by a representative of a seafood firm in Seattle, Wash.

**TRADE EXPANSION ACT AMENDMENT:** H. R. 8490 (Monagan) introduced in House Sept. 18, 1963, to amend the Trade Expansion Act, 1962. Would amend the "adjustment assistance" provisions of section 301 of the act so as to permit action by the Tariff Commission where imports have been a substantial cause of injury; referred to the Committee on Ways and Means.

In presenting the bill, Congressman Monagan stated, in part, "According to a recent report, the (Tariff) Commission has completed 11 investigations under section 301. In all cases, the Commission unanimously found no basis for qualifying the petitioner for assistance under the act. The principal reason for this Commission finding has been the requirement of the law that the Commission determine that increased imports shall be a major cause of injury to the petitioner. . . . Accordingly, I have prepared and filed a bill to amend section 301 of the Trade Expansion Act to substitute for major cause the phrase substantial factor in causing. This will permit action by the Commission in its discretion where imports have been a substantial cause of injury, but will not make it mandatory that the Commission find such injury only when at least 51 percent of the cause shall have been the imports." (Congressional Record, Sept. 18, 1963, pages 16431-16432.)

**TRANSPORTATION ACT OF 1963:** The Surface Transportation Subcommittee of the Senate Committee on Commerce Sept. 30, 1963, resumed hearings on S. 1062, to provide for strengthening and improving the national transportation system and for other purposes. The hearings were recessed, subject to call, on Oct. 7, 1963.

See Transportation Bills for hearings held on H. R. 4701.

**TRANSPORTATION BILLS:** Transportation Act 1963, Part I and II (Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives, 88th Congress, 1st Session), 584 and 583 pages respectively, illus., printed. Part I contains hearings held on Apr. 30, May 1, 2, 3, 7, 8, 9, 1963, on H. R. 4700, to exempt certain carriers from minimum rate regulation in the transportation of bulk commodities, agricultural and fishery products, and passengers, and for other purposes; and H. R. 4701, to provide for strengthening and improving the national transportation system and for other purposes; reports by various Federal agencies on the bills and testimony given by industry people. Part II contains the hearings held on May 10, 17, June 4, 5, 6, 7, 1963, on H. R. 4700 and H. R. 4701; the President's message to Congress dated Mar. 5, 1963, and statements of personnel of various Federal agencies and industry people.

**UNITED STATES TERRITORIAL LIMITS:** The Senate on Sept. 30, 1963, was presented with a resolution from the Senate of the State of Massachusetts entitled "Resolution Urging the Congress of the United States to Take Appropriate Action to Extend the Present Territorial Limits," referred to the Senate Committee on Commerce. The resolution urges the Congress to extend the territorial limits in regard to fishing rights from the present 3-mile limit to one of 200 miles.

**VESSEL CONSTRUCTION SUBSIDY AMENDMENTS:** The Senate, October 2, 1963, passed with amendments,

S. 1006, to amend the Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. Provides for a \$10 million annual appropriation and the Program is limited to a five-year period. Provides a subsidy up to 55 percent of the cost of construction of a fishing vessel in a domestic shipyard, and deletes Section 4 from the recently expired Program which limited construction of such vessels to fisheries injured by foreign imports.

**WATER POLLUTION CONTROL ADMINISTRATION:** The Special Subcommittee on Air and Water Pollution of the Senate Committee on Public Works on Sept. 25, 1963, in executive session, approved for full committee consideration with amendments S. 649.

The Senate Committee on Public Works, on October 4, 1963, reported favorably, with amendments, S. 649, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the

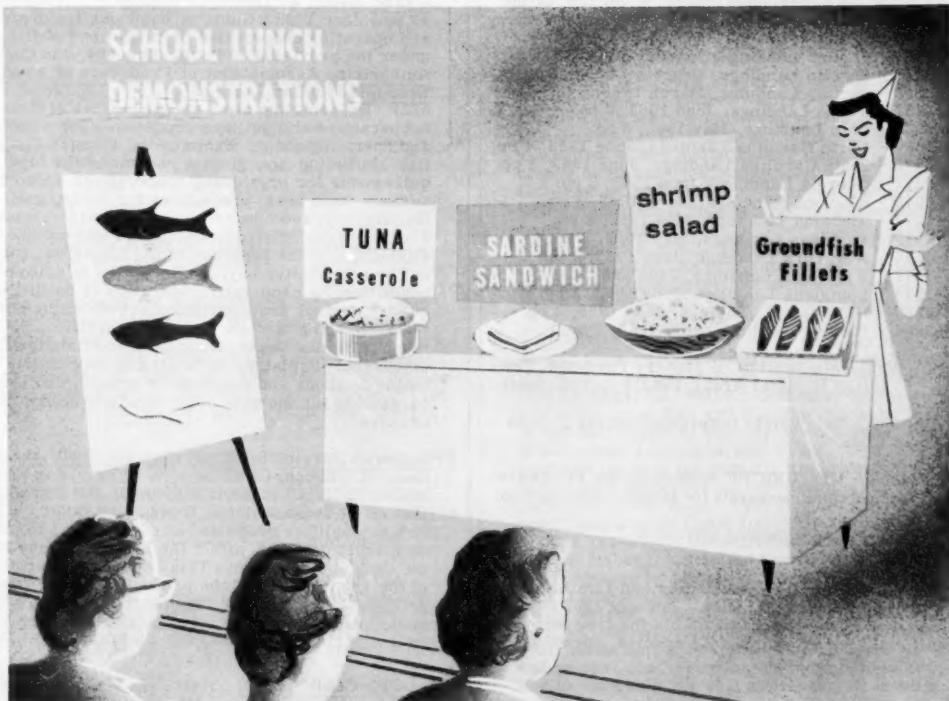
issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes.

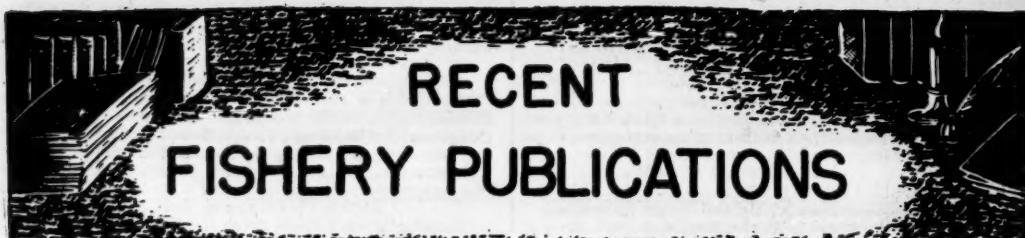
**S. Rept. 556, Federal Water Pollution Control Act Amendments of 1963** (October 4, 1963, report from the Committee on Public Works, United States Senate, 88th Congress, 1st Session, 35 pp., printed. The Committee recommended passage (with amendments) of S. 649. Contains the purpose of the bill, general statement, and the major provisions of the bill.

Senator Muskie spoke from the floor of the Senate on October 7, 1963, calling attention to the purpose of the bill (Congressional Record, pages 17818-17819).

Senator Mansfield, during an address to the Senate on October 7, 1963, concerning the problem of water pollution, referred to the provisions of S. 649 (Congressional Record, pages 17807-17809).

The Senate on Oct. 16, 1963, passed with amendments S. 649.





# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
FL - FISHERY LEAFLETS.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3229	- Massachusetts Landings, by Gear and Subarea, 1962 Annual Summary, 14 pp.
CFS-3244	- Maryland Landings, 1962 Annual Summary, 9 pp.
CFS-3261	- Shrimp Landings, January 1963, 7 pp.
CFS-3262	- Shrimp Landings, February 1963, 7 pp.
CFS-3263	- Shrimp Landings, March 1963, 7 pp.
CFS-3267	- Maine Landings, June 1963, 4 pp.
CFS-3268	- Ohio Landings, May 1963, 3 pp.
CFS-3269	- North Carolina Landings, June 1963, 4 pp.
CFS-3270	- South Carolina Landings, June 1963, 3 pp.
CFS-3271	- Georgia Landings, June 1963, 3 pp.
CFS-3272	- Alabama Landings, April 1963, 3 pp.
CFS-3273	- Alabama Landings, May 1963, 3 pp.
CFS-3275	- Michigan Landings, May 1963, 3 pp.
CFS-3276	- New York Landings, June 1963, 4 pp.
CFS-3277	- Wisconsin Landings, June 1963, 2 pp.
CFS-3278	- Louisiana Landings, June 1963, 2 pp.
CFS-3282	- Mississippi Landings, June 1963, 3 pp.
CFS-3296	- Florida Landings, July 1963, 8 pp.

SL-19 - Wholesale Dealers in Fishery Products, Louisiana (Coastal Area), 1962, 6 pp. (Revised).

Sep. No. 689 - Net-Weight Determination for Frozen Glazed Fish.

Sep. No. 690 - MIT-UNICEF Studies on the Production of Fish Protein Concentrate for Human Consumption.

Sep. No. 691 - Can-Draining Device to Aid Sample Inspection.

FL-436 - Commercial Possibilities and Limitations in Frog Raising, 5 pp., illus., January 1963 (Revised). Discusses areas suitable for frog farming, artificial feeding, edible frog species, spawning,

growth, diseases, protective regulations, methods of capture, and shipping frogs alive.

SSR-Fish. No. 406 - Oceanographic Observations, 1960, East Coast of the United States, by C. Godfrey Day, 64 pp., illus., 1963.

SSR-Fish. No. 424 - Photographic Census of the Steller Sea Lion Herds in Alaska, 1956-58, by Ole A. Mathison and Ron J. Lopp, 24 pp., illus., 1963.

SSR-Fish. No. 452 - A Towed Pump and Shipboard Filtering System for Sampling Small Zooplankters, by Charles P. O'Connell and Roderick J. H. Leong, 22 pp., illus., Ma. '63.

Organizing and Operating Fishery Cooperatives in the United States, by Leslie D. McMullin, Circular 155, 62 pp., June 1963. Guide or handbook for organizing and operating cooperative organizations of fishermen under the provision of Public Law 464, 73d Congress, Authorizing Associations of Producers of Aquatic Products (46 Stat., sec. 1213; 15 U. S. C. secs. 521-522). Presents the aims and principles of fishery cooperatives and outlines procedures for organizing and operating them. Explains the Fishery Cooperative Marketing Act, gives a resume of the legal requirements for organizing cooperatives under the various State laws, procedures for incorporation, tax liability, and other important considerations, such as responsibilities of officers and members. Explains how the expenses of the fisherman can be cut by cooperative buying of supplies in discount quantities, by cooperative operation of facilities for quality control, transportation services, processing, freezing, icing, and packing. Cooperative procurement of fishing vessel equipment and fishing gear is discussed. Explained in detail are cooperative marketing methods and cooperative action in collective bargaining for the sale of the products to fish processors.

Producers' Margins for Food Fish and Shellfish, by David K. Sabock, Circular 156, 35 pp., illus., November 1962. Changes in the supply and demand for particular fresh, canned, frozen, and other types of fish or shellfish products, or changes in processing or marketing costs, affect the producers' share of the consumer's dollar. This report is illustrative of the relative size of the producers' share (that is, producers' margin) for particular fishery products (and also the complementary marketing margins) over a period of years and in a wide variety of cir-

cumstances. It describes the major influences on producers' margins and changes in those margins caused by product differences and the element of time.

Progress in 1961-62, Circular 163, 36 pp., illus., February 1963. This report summarizes scientific accomplishments for the years 1961-62 and future projects of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu. Gives cryptic descriptions of the Laboratory's research in the general fields of oceanography, tuna subpopulations, skipjack ecology, fishery potentials, experimental gill-net fishing for skipjack, albacore ecology, and tuna behavior.

"Quality Changes in Whiting Stored in Ice as Indicated by Organoleptic and Objective Tests," by Joseph M. Mendelsohn and John A. Peters, 6 pp., illus. (Reprinted from *Fishery Industrial Research*, vol. 2, no. 1, 1963, pp. 1-6.)

Skipjack--A World Resource, Circular 165, 30 pp., illus., printed. Contains information available on skipjack that may be useful in planning future fishing ventures. Reports on skipjack with reference to distribution, behavior, stock composition, and sea and weather conditions in relation to fisheries distribution.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

Number	Title
MNL-9	- Fishery Developments in the Philippines, 1962, 6 pp.
MNL-44	- Icelandic Fisheries, 1962, 20 pp.
MNL-83	- Preliminary Report on Japan's Landings of Fish and Aquatic Products, 1961-1962, 11 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE IchTHYOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FISH AND WILDLIFE SERVICE, U. S. NATIONAL MUSEUM, WASHINGTON, D. C. 20560.

Deepsea Fishes of the Far-Eastern Seas; The Deep-water Fishes of the Kurile Kamchatka Trench; Fishes from the Greatest Depths, by T. S. Rass, 9 pp., processed. (Translated from the Russian, *Priroda*, no. 2, 1953, pp. 107-110; *Trudy Zoologicheskogo Instituta Akademii Nauk SSSR*, vol. 6, 1956, p. 2; *Priroda*, no. 7, 1958, pp. 107-108.)

A Fish New to the Fauna of the USSR--Eriilepis (ERILEPIS ZONIFER)--Lock--Pisces, Anoplopomidae) from the Kamchatkan Waters of the Pacific Ocean, by A. P. Andriashov, 9 pp., processed. (Translated from the Russian, *Voprosy Ikhtiolozii*, no. 4, 1955, pp. 3-9.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE BIOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

20 Years of Seasonal Fishing Restrictions on Plaice in the Ostsee, by R. Kandler, Translation Series No. 33, 8 pp., processed, October 15, 1961. (Trans-

lated from the German, *Fischereiwelt*, vol. 4, no. 3, March 1952, pp. 33-35.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, April and May 1963, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, August 1963, 10 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, July and August 1963, 13 pp. each. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Development of Modern Fisheries: Experiences in the United States, by Lionel Wallford, 14 pp., processed. (Sandy Hook Marine Laboratory, U. S. Fish and Wildlife Service, P. O. Box 428, Highlands, N. J.) A survey of the United States fishing industry. Discusses, among other subjects, applicability of United States fisheries to newly developing areas; industries on which important fisheries are based; necessity of fishery science; impact of other industries on fishery resources; public fishing for recreation and food; knowledge, the key factor in stimulating the development of fisheries; the menhaden fishery; the Pacific sardine; and miscellaneous shore fishes.

Gulf Fisheries (Selected Areas) - 1962, by E. J. Barry, 41 pp., illus., processed, 1963. (Market News Service, U. S. Fish and Wildlife Service, 600 South St., New Orleans, La. 70130.) Summarizes the commercial landings of fish and shellfish for selected areas of the Gulf States of Florida (West Coast), Alabama, Mississippi, Louisiana, and Texas. The tables show landings for only the specific areas designated and cannot be interpreted as representing the total landings for a given State. Part I reports on trends and conditions in Gulf Coast fisheries during 1962 and gives a resume of the individual fisheries. For the shrimp fishery, a detailed account is presented of total landings by states, extent of coverage of landings, composition of shrimp landings by species and sizes, prices, canning, processed frozen shrimp, imports and exports, cold-storage stocks, and general trends and developments. Discusses production and market conditions for the oyster, blue crab, and finfish fisheries, as well as imports of fresh and frozen fish and shellfish. Part II includes statistical tables showing total fishery products landings; crab

meat production by areas and months; fishery imports through the New Orleans and Morgan City, La., Customs Districts, Port Isabel and Brownsville, Tex., and Mobile, Ala.; and LCL express shipments from New Orleans for 1962 by months and destination. Also includes tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States weekly oyster and shrimp packs, 1961/62 season and packs by season 1957-62; and fishery products market classifications in the Gulf area.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, July 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July and August 1963, 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

New England Fisheries--Monthly Summary, July 1963, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

"The Preparation of Alkyl Esters from Highly Unsaturated Triglycerides," by E. J. Gauglitz, Jr. and L. W. Lehman, 2 pp., illus., printed. (Reprinted from The Journal of the American Oil Chemists' Society, vol. XXXX, no. 5, May 1963, pp. 197-198.) (Technological Laboratory, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. East, Seattle, Wash. 98102.)

"Preparation of Highly Purified Fatty Acids Via Liquid-Liquid Partition Chromatography," by O. S. Privett and E. Christensen Nickell, 5 pp., illus., printed. (Reprinted from The Journal of the American Oil Chemists' Society, vol. XXXX, no. 5, May 1963, pp. 189-193.) (Technological Laboratory,

U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. East, Seattle, Wash. 98102.)

Receipts of Fresh and Frozen Fishery Products at Baltimore's Wholesale Fish Market, 1962, by James A. Coyne, 55 pp., illus., processed, 1963. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) The first part of this report is a summary of receipts of fresh and frozen fishery products on the Baltimore Wholesale Fish Market in 1962, giving comparisons with receipts in 1961. Includes information on crab meat, hard crabs, oysters, soft crabs, striped bass, scup (porgy), shad, hake, butterfish, whiting, white perch, fluke, red hake, spot, and croakers. Also covers Baltimore foreign trade in fishery products and wholesale market classifications. The second part of the report covers statistics on receipts of fresh and frozen fishery products, such as species by states and countries; fish and shellfish totals by months; states and countries by species; domestic and imported totals by months; species by months; and states and countries by months. Also covers 1962 price ranges for fresh fish and shellfish, and conversion factors used to convert shellfish to pounds.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, August 1963, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings, and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

This is a Pondfish Hatchery, Circular 40, 8 pp., illus., printed, 5 cents, revised, 1963.

Tips on Cooking Fish and Shellfish, 10 pp., illus., printed, 10 cents, 1958. Contains 18 taste-tempting recipes for cooking fish and shellfish. Includes a purchasing guide describing various forms and cuts of fish; and gives a list of suggested foods that can be used for garnishing fish dishes.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ABALONE:

"Chemical Studies on the Meat of Abalone (Haliotis discus Hannai). I," by Eiichi Tanikawa and Jiro

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Yamashita, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, November 1961, pp. 210-238, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### ADDITIVES:

Procedures for the Testing of Intentional Food Additives to Establish Their Safety for Use, Second Report of the Joint FAO/WHO Expert Committee on Food Additives, 22 pp., printed, 30 cents. Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y., 1958.

#### ALASKA:

1961 Alaska Commercial Fisheries Catch and Production Statistics, by Philip E. Chitwood, Statistical Leaflet No. 3, 19 pp., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska. Presents statistical tables on licensed operating units, by region; catch summary; catch and value to fishermen, by region and by gear; salmon catch by gear and region, in numbers of fish; and salmon catch by district, in numbers of fish. Also contains tables on comparative catch of salmon and shellfish; average weights of salmon by region; transporting, wholesaling, and manufacturing; summary of products as prepared for market; and production of canned products, in standard cases. Most data are for 1961.

#### ALGAE:

"Acid Functions of Several Algae Polysaccarides," by R. Springer and L. Middendorf (University of Munich, Munich, Germany), article, Chemical Abstracts, vol. 56, April 2, 1962, 7437g, printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Extraction of Carrageenate from Algae," by Gerard Maton and Marcel Maton, article, Chemical Abstracts, vol. 57, July 9, 1962, 1340f, printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

"Hypocholesterolemic Agents Derived from Sterols of Marine Algae," by E. Reiner, J. Topliff, and J. D. Wood, article, Canadian Journal of Biochemistry and Physiology, vol. 40, no. 10, October 1962, pp. 1401-1406, illus., printed, single copy C\$2. Division of Administration and Awards, National Research Council, Ottawa 2, Canada.

#### ALGINATES:

"Studies on Soluble Alginates. III--On the Metachromasy of the Soluble Alginates--Lithium Alginate, Sodium Alginate, Potassium Alginate, and Ammonium Alginate," by Miki Oguro, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, August 1961, pp. 138-150, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### ANGOLA:

"Pesca em Angola" (Angola's Fisheries), by Jaime Henrique de sa Viana Couceiro, article, Boletim da Pesca, vol. XV, no. 79, June 1963, pp. 21-36, printed in Spanish. Boletim da Pesca, Gabinete de Estudos das Pescas, 644 R. S. Bento, Lisbon, Portugal.

#### ANTIBIOTICS:

"Antibiotic Activity of Lipids Isolated from Blue-Green Algae," by A. N. Shinkarenko, article, Chemical Abstracts, vol. 55, December 25, 1961, 2778a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### AQUATIC PLANTS:

"Chemische Bekämpfung von Überwasserpflanzen (Gelege) mit 3 F und Omnidel Spezial in der Teichwirtschaft" (Chemical Control of Emergent Plants with the Herbicides 3 F and Omnidel Special in Pond Management), by M. Schlüter, No. 220, 13 pp., illus., printed in German. (Reprinted from Deutsche Fischerei-Zeitung, vol. 9, no. 11, 1962, pp. 328-340.) Überreicht vom Institut für Fischereiwesen, der Humboldt-Universität zu Berlin, Josef-Nawrocki-Strasse 7, Berlin-Friedrichshagen, Germany.

#### BACTERIOLOGY:

"A Method for Rapid Detection of Alginic Acid-Digesting Bacteria," by Takashisa Kimura, article, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, May 1961, pp. 41-47, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### BELGIUM:

Rapport Annuel sur l'Evolution de la Flotte de Peche en 1962 (Annual Report of the Status of the Fishing Fleet in 1962), 43 pp., processed in French. Administration de la Marine et de la Navigation Interieure, Ministere des Communications et des Postes, Telegraphes et Telephones, Brussels, Belgium.

#### BIOCHEMISTRY:

"The Use of Formaldehyde-Treated Alginic Acid in the Chromatographic Determination of Organic Bases," by J. S. Foster and J. W. Murfin, article, Chemical Abstracts, vol. 55, October 16, 1961, 21479g, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### BREAM:

"Bream Tagging Experiments in East Gippsland During April and May 1944," by A. Dunbavin Butcher and John K. Ling, Fisheries Contribution No. 11, 9 pp., illus., printed. (Reprinted from Vict. Nat., vol. 78, January 1962, pp. 256-264.) Victoria Fisheries and Wildlife Department, Melbourne, Australia, 1962.

#### CALIFORNIA:

California Fish and Game, vol. 49, no. 3, July 1963, 99 pp., illus., printed, single copy 75 cents. Department of Fish and Game, Printing Division, Documents Section, Sacramento 14, Calif. Includes, among others, articles on: "A Doratopsis Larva of the Squid Family Chiroteuthidae in Californian Waters," by S. Stillman Berry; "The Sea Turtle Fishery of Baja California, Mexico," by David K. Caldwell; "Trawling in the Monterey Bay Area, with Special Reference to Catch Composition," by Richard F. G. Heimann; "Effect of Ocean Temperature on the Seaward Movements of Striped Bass, Roccus saxatilis, on the Pacific Coast," by John Radovich; "More Giant Squids from California," by Allyn G. Smith; "A Second Large Catch of Pacific Round Herring," by John G. Carlisle, Jr.; and "Greenland Halibut, Reinhardtius hippoglossoides (Walbaum) Added to California Fauna," by E. A. Best.

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#### CANADA:

Journal of the Fisheries Research Board of Canada, vol. 20, no. 3, May 1963, 289 pp., illus., printed, single copy C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, these articles: "Observations on the Oil and Component Fatty Acids of the Oil from Newfoundland Capelin," by R. G. Ackman and others; "Effects of Artificial Propagation and the Weather on Recruitment in the Lake Ontario Whitefish Fishery," by W. J. Christie; "Interspecific Competition and Exploitation," by P. A. Larkin; "Marine Fish Tissue Culture," by P. M. Townsley, H. G. Wight, and M. A. Scott; "Effects of Temperature on Growth of Zooplankton, and the Adaptive Value of Vertical Migration," by Ian A. McLaren; "Amino Acid Composition of Representatives of Eight Bacterial Genera with Reference to Aquatic Productivity," by James E. Stewart and others; "The Spatial Distribution of Fish in Gill Nets," by A. J. Berst and A. M. McCombie; "The In-Vitro Maturation of the Parasitic Nematode, Terranova decipiens, from Cod Muscle," by P. M. Townsley and others; "Sympatric Occurrence of Two Species of Humpback Whitefish in Aquanga Lake, Yukon Territory," by C. C. Lindsey; "Observations on Behavior of Juvenile Brown Trout in a Stream Aquarium during Winter and Spring," by G. F. Hartman; "The Uptake and Detoxification of C<sup>14</sup>-Labelled DDT in Atlantic Salmon, Salmo salar," by F. H. Premdas and J. M. Anderson; "Application of the Palloheimo Linear Equation for Estimating Mortalities to a Seasonal Fishery," by Barry S. Muir and Harold White; and "Migrations of Haddock between the Gulf of St. Lawrence and Offshore Nova Scotian Banks," by F. D. McCracken.

#### CAVE FISH:

"Comments on the Relationships of the North American Cave Fishes of the Family Amblyopsidae," by Donn Eric Rosen, article, American Museum Novitates, no. 2109, October 29, 1962, pp. 1-35, illus., printed. American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y.

#### CEPHALOPODS:

South African Cephalopods, by Gilbert L. Voss, Contribution No. 382, 29 pp., illus., printed. (Reprinted from Transactions of the Royal Society of South Africa, vol. 36, part 4, November 1962, pp. 245-272.) Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### CHEMICAL CHANGES:

"Studies on the Browning of Fish Flesh, VII--Fluorescence and Flavor of Autoclaved Sugar--Amino Acid System," by Fumio Nagayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, January 1962, pp. 45-48, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

#### CLAMS:

"Benthic Survey for Populations of Soft-Shelled Clams, Mya arenaria, in the Lower Potomac River, Maryland," by H. T. Pfizenmeyer and K. G. Droebeck, article, Chesapeake Science, vol. 4, no. 2, June 1963, pp. 67-74, illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Exploratory sampling of the poten-

tial soft-shelled clam bottoms in the Potomac estuary was conducted to define the range and densities of the subtidal populations of Mya arenaria. Bottom samples were taken at depths ranging from 3 to 11 feet with the Maryland hydraulic clam dredge using a  $\frac{1}{8}$ -inch mesh conveyor belt. Clam populations ranged from the mouth of the river to Popes Creek, approximately 40 miles upriver. The denser populations of over 300 bushels per acre were found between Sandy Point and Swan Point, or 16 to 33 miles from the river mouth. Clam densities were extremely variable in this area, and were related to changes in bottom type and the instability of shoal water bottoms brought about by wind and wave action.

#### COD:

"Changes in Amount of Myosin Extractable from Cod Flesh during Storage at -14°," by J. J. Connell, Torry Memoir No. 131, 11 pp., illus., printed. (Reprinted from Journal of the Science of Food and Agriculture, vol. 13, no. 11, November 1962, pp. 607-617.) Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"New Factors Involved in the Denaturation of Frozen Cod Muscle Protein," by R. Malcolm Love, article, Journal of Food Science, no. 27, November-December 1962, pp. 544-550, printed. Institute of Food Technologists, 510-522 No. Hickory St., Champaign, Ill.

#### COD-LIVER OIL:

"The Influence of Various Materials on the Quality of Cod-Liver Oil. II--Varnishes, III--Behavior of Some Commercial Light Metals," by H. J. Papenfuss (VEB, Fischkombinat, Rostock, Germany), article, Chemical Abstracts, vol. 57, September 17, 1962, 7390d and 7390f, respectively, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### COMMERCIAL FISHERIES:

Industrial Fishery Technology (A Survey of Methods for Domestic Harvesting, Preservation, and Processing of Fish Used for Food and for Industrial Products), by Maurice E. Stansby, 403 pp., illus., printed, \$12. Reinhold Publishing Corporation, 430 Park Ave., New York 22, N. Y., 1963. General information and specific data about the United States fishing industry are to be found in this book. Written by a group of commercial fishery experts, the subject is divided into three major parts. Fish and fishery methods are discussed in Part I; important fisheries and their products are described in Part II; fishery industrial products are covered in Part III; preservation methods used for fishery products are reviewed in Part IV; and food science applications make up Part V. Some brief consideration is given to world fisheries, but the chief emphasis is upon fisheries of the United States. In his preface, the author himself points out with complete candor that, "As is inevitable with a book written by a large group of specialists, there is some duplication, and certain areas are not covered as thoroughly as are others of perhaps somewhat less importance." Nearly all the chapters have literature cited sections, but the author also includes an extensive general bibliography under nine different headings; general and miscellaneous; composition and nutrition;

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chemistry and microbiology; spoilage, preservation, quality, and specifications; harvesting of fish; handling fresh fish; freezing and cold storage; canning and curing; and industrial products and animal feeds. A good index is also included. Since this is really not a technical book, it should have wide appeal and would be a valuable addition to the library of any fisherman, processor, merchandiser, student, or researcher.

--Joseph Pileggi

#### CURED FISH:

"The Influence of Drying, Salting and Smoking on the Nutritive Value of Fish," by C. L. Cutting, *Torry Memoir No. 128*, 19 pp., illus., printed in English with French and Spanish summaries. (Reprinted from *Fish in Nutrition*, 1962.) *Torry Research Station*, Aberdeen, Scotland.

#### DENMARK:

"Dansk fiskehalkonserve--En status pa grundlag af statistiske oplysninger" (Danish Canned Fish; Present Status Based on Statistical Information), by Hakon Nielsen, article, *Konserves & Dybfrost*, vol. 21, no. 5, 1963, pp. 58-60, printed in Danish. *Teknisk Forlag, Vester Farimagsgade 31, Copenhagen V, Denmark.*

#### ENZYMES:

"Distribution of a Lipase Enzyme in Lingcod Fillets and the Effect of Low Temperature Storage on Its Activity," by J. D. Wood, article, *Journal of the Fisheries Research Board of Canada*, vol. 16, October 1959, pp. 755-757, printed. *Queen's Printer and Controller of Stationery, Ottawa, Canada.*

#### EUROPEAN FREE TRADE ASSOCIATION:

*Second Annual Report of the European Free Trade Association, for the Period 1st July, 1961 - 30th June, 1962*, 39 pp., illus., printed. *Secretariat, European Free Trade Association, Geneva, Switzerland*, July 1962. (Available from European Free Trade Association, Information Office, 711 14th St. NW., Washington, D.C.) Included is a short section on the Association's action in expanding trade in the areas of agriculture, fish, and other marine products.

*Stockholm Convention Examined*, 83 pp., printed. *Secretariat, European Free Trade Association, Geneva, Switzerland, January 1963.* (Available from European Free Trade Association, Information Office, 711 14th St. NW., Washington, D.C.) Chapter 6, which covers agriculture and fish, discusses, among other items, trade in fish and other marine products, and the general procedural provisions of the Convention as they apply to the agricultural and fisheries sectors as a whole.

#### EXPORTS:

*United States Exports of Domestic and Foreign Merchandise (Commodity by Country of Destination)*, 1962 Annual, Report No. FT 410, processed, Part I, 211 pp., \$1.25; Part II, 353 pp., \$2. *Bureau of the Census, U. S. Department of Commerce, Washington, D. C.*, May 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Statistics in Part

I cover United States exports of domestic and foreign merchandise (including fishery products and byproducts) under group 00 through group 5. Part II covers merchandise under groups 6 through 9 (some items of interest to the fishery and allied industries are included). Data are shown by commodity and country of destination.

**United States Exports of Domestic and Foreign Merchandise (SITC Group by Country of Destination and Country of Destination by SITC Group)**, January-December 1962 (Monthly), FT 410 and FT 420 Supplement, 299 pp., processed, \$1.75. *Bureau of the Census, U. S. Department of Commerce, Washington, D. C.*, 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents monthly data of United States exports during 1962 in two sections: three-digit SITC commodity group by country of origin; and country of origin by three-digit SITC commodity group. Includes data on fresh and preserved fish. Also includes a reference listing showing the Schedule B numbers included within each three-digit SITC group.

#### FISH BEHAVIOR:

*Using the Doppler Effect to Detect Movements of Captive Fish in Behavior Studies*, by William C. Cummings, Contribution No. 448, 3 pp., illus., printed. (Reprinted from *Transactions of the American Fisheries Society*, vol. 92, no. 2, April 1963, pp. 178-190.) *Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.*

#### FISH COOKERY:

"Instant Catfish Cleaning," by Don Shiner; "Outdoor Cooking with Foil," articles, *Pennsylvania Angler*, vol. 32, no. 8, August 1963, pp. 12 and 13 respectively, illus., printed, single copy 25 cents. *Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa.* The first article illustrates with photos a simple method of preparing catfish for the pan. The second describes how to construct a cook pot with aluminum foil and presents a recipe for cooking bass or catfish over an outdoor fire.

#### FISH CULTURE:

"Uberlegungen über Neue Wege in der Fischzuchtung" (Considerations on New Ways in Fish Breeding), by Ulrich Lieder, No. 218, 6 pp., printed in German. (Reprinted from *Deutsche Fischerei-Zeitung*, vol. 10, no. 3, 1963, pp. 82-87.) Überreicht vom Institut für Fischereiwesen, der Humboldt-Universität zu Berlin, Josef-Nawrocki-Strasse 7, Berlin-Friedrichshagen, Germany.

#### FISH DETECTION:

"Das Echographen-Forschungsprogramm des Instituts für Fischereiwesen" (The Echo-Sounder Research Program of the Institute of Fisheries), by Ulrich Lieder, no. 217, 3 pp., illus., printed in German. (Reprinted from *Deutsche Fischerei-Zeitung*, vol. 10, no. 4, 1963, pp. 120-122.) Überreicht vom Institut für Fischereiwesen, der Humboldt-Universität zu Berlin, Josef-Nawrocki-Strasse 7, Berlin-Friedrichshagen, Germany.

#### FISHING TECHNIQUES:

*Fish Capture (Being the Buckland Lecture for 1959)*, by Ronnie Balls, 148 pp., illus., printed. *Edward*

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Arnold (Publishers) Ltd., 41 Maddox St., London W1, England, 1961. Discusses primitive and modern fishing methods, fish finders, behavior of fish, mechanization of gear, manpower, food chains, conservation, and related subjects. The author points out that the logical approach to trawling is to put power first, and then to consider how to work the gear with as few men as possible. He cites American shrimp trawlers as examples of an efficient approach. In the shrimp fishery it is not uncommon for vessels of 65 feet, manned by only 2 or 3 men, to make very long voyages. These vessels are sufficiently powered to enable the taking of the shrimp by means of two 45-foot trawls, one towed from each side by outriggers, rather than confining the tow to a single trawl.

#### FISH SKIN:

"A New Fluorescent Hydrocarbon in the Skin of Fish," by Shuishi Hirao and Ryo Kikuchi, article, Chemical Abstracts, vol. 55, September 4, 1961, 17931g, printed. The American Chemical Society, 1155 16th St. NW, Washington 6, D.C.

#### FISH SOUNDS:

Significance of Certain Fish Sounds, USSR, by V. R. Protasov and Ye V. Romanenko, OTS 63-21396, 15 pp., printed, 50 cents. Office of Technical Services, Department of Commerce, Washington, D.C. 20230, March 1963.

#### FOOD ADDITIVES:

What Consumers Should Know About Food Additives, Food and Drug Administration Publication No. 10, 14 pp., illus., printed, 15 cents. Food and Drug Administration, U.S. Department of Health, Education, and Welfare, Washington, D.C., 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Included are sections on the history of the use of chemical preservatives; the contributions of food chemistry to better living; public health safeguards; the latest legislation to regulate the use of food additives; how the law works; and Food and Drug Administration testing of foods. Details are presented on the various types of additives such as nutrient supplements, nonnutritive sweeteners, preservatives, emulsifiers, and others; special classes of additives such as pesticides and coal-tar colors; drugs and additives in livestock feeds; and requirements of label declaration when additives are used.

#### FOOD POISONING:

Clinical-Epidemiological Characteristic of an Outbreak of Botulism, Connected with the Use of Canned Flounder for Food, by V. M. Bauman, V. N. Yagodinskii, and Yu. V. Filippovich, Trans. V-1795, 12 pp., processed. (Translated from the Russian, Zhurnal Mikrobiologii, Epidemiologii i Immunologii, vol. 33, no. 7, July 1962, pp. 92-95.) National Agricultural Library, U.S. Department of Agriculture, Washington, D.C. 20250.

#### FOREIGN INVESTMENT:

Aids to Business (Overseas Investment), 46 pp., printed, 25 cents. Agency for International Development, U.S. Department of State, Washington, D.C., 1963. (For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Outlines the congressional tools

which now enable the Agency for International Development (AID) to enlist American business collaboration in our foreign aid program. Each chapter describes a separate program--who is eligible to participate, the terms and conditions, and how to apply to AID. It also includes a discussion of some of the programs administered by other United States and international financial institutions.

#### FOREIGN TRADE:

What You Should Know About Exporting, 38 pp., illus., printed, 25 cents. U.S. Department of Commerce, Washington, D.C., 1963. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) A basic reference for the businessman interested in opening profitable new overseas markets for his products. Discusses the many facilities and resources on which he can draw to enter international trade. Considers such aspects of the subject as pinpointing your markets, sizing up your chances, channels for trading, picking your overseas partners, handling the order, promoting export sales, and other points of interest.

#### FRANCE:

La Peche Maritime et le Pecheur en Mer (The Marine Fishery and the Fisherman at Sea), by Auguste Dupouy, 228 pp., printed in French. Librairie Armand Colin, 103, Boulevard Saint-Michel, Paris, France, 1955.

#### FREEZE-DRYING:

"Forecast on a Food-Processing Method--Freeze-Drying," by Kermit Bird, article, Agricultural Situation, vol. 47, no. 7, July 1963, pp. 6, 9, printed, single copy 5 cents. Statistical Reporting Service, U.S. Department of Agriculture, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.)

"Preservation by Freeze-Drying and the Stability of Virulence of Salmonella typhimurium," by Ellen M. Simon, K. L. Stahl, and J. B. Wilson, article, Applied Microbiology, vol. 11, no. 4, July 1963, pp. 371-376. Illus., printed, single copy \$3. The Williams & Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

#### FRESH-WATER BIOLOGY:

A Guide to the Study of Fresh-Water Biology, by James G. Needham and Paul R. Needham, 117 pp., illus., printed, \$2.25. Holden-Day, Inc., 728 Montgomery St., San Francisco 11, Calif.

#### FROZEN FISH:

"Cell Damage from Excess Cutting of Fish Adversely Affects Frozen Seafood Quality," by Frederick J. King, article, Quick Frozen Foods, vol. 25, December 1962, pp. 115-116, printed. Quick Frozen Foods, E.W. Williams Publications, Inc., 82 Wall St., New York 5, N.Y.

"Identifying Quality Changes in Frozen Fish," by A. Banks, Torry Memoir No. 122, 10 pp., printed in English with French summary. (Reprinted from Supplement au Bulletin de l'Institut International du Froid, 1962.) Torry Research Station, Aberdeen, Scotland.

#### GEAR:

Indian Fisheries Bulletin, vol. IX, no. 4, October 1962, 51 pp., illus., printed, single copy Re. 1.00 (about 21

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U.S. cents). Department of Food, Ministry of Food and Agriculture, New Delhi, India. Contains papers presented and recommendations made at the All India Conference of Craft and Gear Technologists, Veraval, Gujarat State, November 11-13, 1961. Includes papers on: "The Design and Operation of Bottom Set Gill Nets for Lobster," by A. V. V. Satyanarayana and K. A. Sadanandan; "The Designs of Otter Trawls for Shrimp," by A. V. V. Satyanarayana and R. S. Nair; "Trawling Experiments in Punaiyakal Madai, Gulf of Mannar," by S. Thyagarajan and S. Mahadevan; "Certain Aspects about Improved Gear in Prawn Fishing," by G. K. Kurian, S. D. Deshpande, and N. A. George; and "A Note on Record Catch in a 40 Ft. Trawl Net at Mangalore," by B. Santharam Rai. Also includes a section of papers on fishing craft and gear.

#### GERMAN FEDERAL REPUBLIC:

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#### GLUCOSAMINE:

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"Obtaining Glucosamine from Crustaceans and its Importance in Therapeutics," by S. Oeriu, Maria Agnes Dimitriu, and I. Craescu (Rumanian Academy, Bucharest, Romania), article, *Chemical Abstracts*, vol. 57, October 29, 1962, 11309f, printed. The American Chemical Society, 1155 16th St. NW, Washington 6, D. C.

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May 27, 1963, effective June 1, 1963, establishing Greenland's outer territorial sea as the area within 3 nautical miles from a baseline drawn between the points listed in section 2), 9 pp., printed in Danish and Greenlandic. Ministry for Greenland, Copenhagen, Denmark, 1963.

Bekendtgørelse om Erhvervsmaessig Fangst, Fiskeri og Jagt i Gronland (Announcement No. 192, Ministry for Greenland, May 27, 1963, effective June 1, 1963, limiting fishing, hunting, and whaling in the waters within 12 nautical miles of the inner baseline), 6 pp., printed in Danish and Greenlandic. Ministry for Greenland, Copenhagen, Denmark, 1963.

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"More Ice Would Mean Better Fish," by I. Tatterson and R. Spencer, *Torry Memoir* No. 129, 2 pp., illus., printed. (Reprinted from *Fish Friers' Review*, January 1963.) Department of Scientific and Industrial Research, Humber Laboratory, Hull, England.

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"The Fishes of Champaign County, Illinois, as Affected by 60 Years of Stream Changes," by R. Weldon Larimore and Philip W. Smith, article, *Illinois Natural History Survey Bulletin*, vol. 28, Article 2, March 1963, pp. 298-382, illus., printed. Illinois Department of Registration and Education, Natural History Survey Division, Urbana, Ill.

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#### IMPORTS:

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#### INDIA:

Matsya Vyavasaya (Fish Trade), vol. III, no. 4-5, April-May 1963, 63 pp., illus., printed. The Gujarat Fisheries Central Cooperative Association, Ltd., "Shivprasad" 7, Hindu Colony, Opp. Sardar Patel Stadium, Navrangpura, Ahmedabad 9, India. Includes, among others, articles on: "Performance and Promotion of Fish Export in Gujarat," by N. C. Lakumb; "Planning for Marketing of Prime Fish," by R. K. Mehra; "Progress of the Gujarat Fisheries Central Co-Operative Association Ltd.," "Bombay Duck Fishery of Jaffrabad," by C. R. Easwaran; and "Golden Eggs from Water: Fish Spawn Trade and Co-Operatives."

#### INLAND FISHERIES:

"Über Spurenelemente in den Binnengewässern und ihre Bedeutung für die Binnenfischerei" (On Trace Elements in Inland Waters and Their Importance in Inland Fisheries), by Ulrich Lieder, no. 216, 4 pp., printed in German. (Reprinted from Deutsche Fischerei-Zeitung, vol. 10, no. 4, 1963, pp. 106-109.) Überreicht vom Institut für Fischereiwesen, der Humboldt-Universität zu Berlin, Josef-Nawrocki-Strasse 7, Berlin-Friedrichshagen, Germany.

#### IRRADIATION PRESERVATION:

"The Influence of Irradiation Preservation on the Nutritive Value of Fish and Fishery Products," by J. M. Shewan, Torry Memoir No. 127, 13 pp., illus., printed in English with French and Spanish summaries. (Reprinted from Fish in Nutrition, 1962.) Torry Research Station, Aberdeen Scotland.

#### JACUNDA:

"Notas sobre a Alimentação do Jacunda, *Crenicichla saxatilis* (L., 1758)" (Notes on the Diet of the Jacunda, *Crenicichla saxatilis* - L., 1758), by Rui Simões de Menezes, Series IC, Publication No. 238, 3 pp., illus., printed in Portuguese with English summary. (Reprinted from Bo. Soc. Cear. Agron., vol. 2, June 1961, pp. 51-53.) Serviço de Piscicultura, Fortaleza, Ceará, Brazil.

#### JAPAN:

Bulletin of the Hokkaido Regional Fisheries Research Laboratory, no. 26, March 1963, 147 pp., illus., printed in Japanese with English abstracts. Hokkaido Regional Fisheries Research Laboratory, Yoishi, Hokkaido, Japan. Includes, among others, these articles: "A Study on the Method of Prediction of the Hokkaido Spring Herring Resources," by N. Hanamura; "Consideration on the Differences in Body Length, Sex Ratio and Body Weight in the Pink Salmon Catches of Long-Line and Gill-Net of the Japanese Land-Based Fisheries, with Special Reference to Mesh Selectivity," and "A New Quantita-

tive Sampler for Large Crustacean Plankton," by T. Ishida; "Limb Loss and Recovery in the Young King Crab, *Paralithodes camtschatica*," and "Ecology of Shrimps on the Eel-Grass Bed: I - *Spirontocaris propugnatrix*, II - *Leander macrodactylus* and Others, III - Shrimps in Relation to their Environment," by H. Kurata; "Biochemical Studies on Squid: XVIII - Glycogen in Muscle (1)," by K. Kitabayashi and others; "XIX - On the Glucosamin Content in the Pen," XX - On the Cloudiness of the Extracts Obtained from Squid Muscle; "Studies on the Proteins of Fish Skeletal Muscle in Relation to the Prevention of their Denaturation. I - Denaturation of Myosin," by K. Kitabayashi and S. Ishikawa; "The Change of the Lipid System in Fish Meat at Several Treating and Manufacturing Courses," by K. Miwa; and "Changes in Muscle Protein of Alaska Pollack during Storage in Ice," by T. Tokunaga.

#### JELLYFISH:

"Freshwater Jellyfish," by James Green, article, New Scientist, vol. 19, no. 347, July 11, 1963, pp. 90-91, illus., printed, single copy 1 s. (about 14 U. S. cents). New Scientist, Cromwell House, Fulwood Pl., High Holborn, London WC1, England. Studies of the distribution of freshwater jellyfish have led from a tank in Regents Park, London, to a great lake in East Africa. Present knowledge of the few species known from fresh water suggests that they have descended from their relatives in the sea.

#### LABOR LEGISLATION:

Equal Pay Act, 1963, P. L. 88-38, 4 pp., processed. Labor Relations and Legal Department, the Chamber of Commerce of the United States, 1615 H St. NW, Washington 6, D. C. A digest and analysis of the Equal Pay Act of 1963. The law prohibits payments to employees within any establishment of wage differentials based on sex by employers subject to the Fair Labor Standards Act where there is equal work on jobs, the performance of which requires equal skill, effort, responsibility, and which is performed under similar working conditions. Wage differentials are specifically recognized where based on a legitimate seniority system, merit system, quantity or quality of production, or any factor other than sex. Investigation and administration of the Act will be under the existing Wage and Hour Division of the Department of Labor.

Highlights of the Equal Pay Act of 1963, 3 pp., processed. Wage and Hour and Public Contracts Divisions, U. S. Department of Labor, Washington 25, D. C., 1963.

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"The Demersal Fish Population of Long Island Sound," by Sarah W. Richards, article, Bulletin of the Birmingham Oceanographic Collection, vol. 18, Article 2, January 1963, pp. 1-101, illus., printed in English with Russian abstracts, \$4. Peabody Museum of Natural History, Yale University, New Haven, Conn.

#### MACKEREL:

"Studies of Dry-Salting and Sun-Drying of Mackerel (*Rastrelliger kanagurtha*). I - Different Conditions of Drying and Their Effect on the Quality of Dry-Cured Product; II - Effect of Chlortetracycline, Sorbic Acid, Sodium Propionate, Sodium Benzoate, and Sodium Acid Phosphate on the Keeping Quality of Sun-

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Dried Mackerel; III--Effect of Varying Proportions of Salt to Fish on the Quality of Sun-Dried Mackerel; IV--Effect of Incorporation of Different Chemicals in the Curing Salt on the Texture and Cooking Quality of the Product; V--Studies on the Storage Characteristics and Packaging of Sun-Dried Salted Mackerel," by D. P. Sen and others, articles, *Chemical Abstracts*, vol. 56, January 22, 1962, 18111, 1812a, 1812b, 1812c, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### MARINE BIOLOGY:

*International Marine Biology*, vol. 1, no. 1, April 1963, 36 pp.; vol. 1, no. 2, August 1963, 34 pp., processed. United Nations Educational, Scientific and Cultural Organization, Place de Fontenoy, Paris-7<sup>e</sup>, France. The first two numbers of a quarterly newsletter prepared jointly by the Office of Oceanography of UNESCO and the Biology Branch of the Fisheries Division of FAO. Intended to help marine scientists, administrators, and government officials to be better informed in international, regional, and national activities of international significance in this field. Sections included are editorial notes, organizations, national oceanographic programs, international projects, meetings, training facilities, miscellaneous news items, and activities of the United Nations and other agencies.

#### MARKETING:

The Handling of Wet Fish during Distribution, Torry Advisory Note No. 3, 6 pp., illus., printed. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland, 1962.

#### MARLIN:

"White Marlin, *Tetrapturus albidus*, in the Middle Atlantic Bight, with Observations on the Hydrography of the Fishing Grounds," by Donald P. de Sylva and William P. Davis, Contribution No. 432, 19 pp., illus., printed. (Reprinted from *Copeia*, vol. 50, no. 1, March 30, 1963, pp. 81-99.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### MOTION PICTURES:

Film Catalog, 29 pp., printed. Division of Information, U. S. Department of the Interior, Washington, D. C. 20240, 1963. The motion pictures listed in this catalog are selected from the film libraries of the various bureaus and offices (including the Fish and Wildlife Service) of the Department of the Interior. They are available, on request, to educational institutions, industrial and agricultural training classes, engineering and professional societies, conservation organizations, civic and business associations, and other responsible public and private groups.

#### NETHERLANDS:

Tien Jaar Zeevisserij (Ten Years of Marine Fishery), by A. G. U. Hildebrandt, Separate No. 3, 5 pp., printed in Dutch. Landbouw-Economisch Institut, Conradkade 175, 'S-Gravenhage, Netherlands, May 8, 1963.

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"A Comparative Account of the Rotting Resistance of Netting Twines of Fibres of Vegetable Origin," by Hideaki Miyamoto, G. K. Kuriyan, and P. J. Cecily,

article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, July 1962, pp. 655-663, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

"Latest on Monofilament Netting of Tuna," by Alan Temple, article, *Fisheries Newsletter*, vol. 22, no. 7, July 1963, pp. 17, 27, illus., printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia.

"On the Mechanical Character of the Drag-Net. II," by Tazae Kawakami and Kei Nakasai, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, July 1962, pp. 664-670, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

Mesure de la Trainee de Fils de Peche (Determination of the Drag on Fishing Nets), by A. Fauquet and J. Pauriche, 5 pp., illus., printed in French. Institut de Mecanique de Fluides, 5, Boulevard Paul Painleve, Lille, France, April 28, 1952.

Results of Laboratory and Field Evaluation of Continuous Filament Isotactic Polypropylene Fibre for Salmon Gill Nets, by P. J. G. Carrothers, Circular No. 66, 16 pp., processed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, July 1962.

#### NORTH ATLANTIC:

"The Soviet Fishery in the ICNAF Area," by Gordon R. Williamson, article, *Canadian Fisherman*, vol. 50, no. 7, July 1963, pp. 17-22, 36, illus., printed, single copy C\$2. National Business Publications Ltd., Gardenvale, Que., Canada. Describes some of the vessels, mostly stern trawlers, the methods of fishing, and the fishermen of the Soviet fishing fleet operating on the Canadian Atlantic seaboard.

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Computer Programs in Oceanography--Preliminary List, 16 pp., processed. Data Processing Branch, National Oceanographic Data Center, Washington 25, D. C. The rapid growth in the use of electronic computers and other automatic data processing devices has created a wide need for up-to-date information about the types of computer programs in use by various institutions for oceanographic applications. This report is the first of a series planned to disseminate such information and contains a preliminary list of computer programs by institution and a sample of a proposed Program Abstract form. Lists the type of computer and program titles or short descriptions to indicate the type of programs in use at each institution.

Journal du Conseil, vol. XXVIII, no. 1, June 1963, 170 pp., illus., printed in French and English, single copy Kr. 16 (about US\$2.35). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. (Available from Messrs. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.) Includes, among others, articles on: "A Study of the Vertical Distribution of Larval Haddock," by David Miller, John B. Colton, Jr., and Robert R. Marak; "Marine Fish Culture in Britain. I--Plaice Rearing in Closed Circulation at Lowestoft, 1957-1960," by J. E. Shelbourne, J. D. Riley, and G. T. Thacker;

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" . II--A Plaice Rearing Experiment at Port Erin, Isle of Man, during 1960, in Open Sea Water Circulation," by J. E. Shelbourn; "III--Plaice (*Pleuronectes platessa*--L.) Rearing in Closed Circulation at Lowestoft, 1961," by J. D. Riley and G. T. Thacker; "On Selection by the Drifter Fleets in the East Anglian Herring Fishery," by A. C. Burd; "Some Notes on the Preservation of Marine Animals," by James Marr; "The Body/Scale Relationship in Atlantic Salmon (*Salmo salar* L.), A Preliminary Report," by Arne Lindroth; and "Random Movement and Orientation in Salmon Migration," by Saul B. Saita and Raymond A. Shappy.

"Las Masas de Agua del Oceano" (The Nature of the Ocean's Waters), by Jose Miguel Arango, article, *Iberica*, vol. 41, no. 11, May 1963, pp. 190-194, illus., printed in Spanish. *Iberica*, Palau, 3, Apartado 759, Barcelona-2, Spain.

National Oceanographic Program, Fiscal Year 1964, ICO Pamphlet No. 11, 71 pp., illus., processed. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington 25, D. C., April 1963. Outlines a coordinated plan for the accomplishment of national goals while pursuing individual agency missions. Discusses program activities in research, instrumentation, ship construction, surveys, manpower and training, international programs, facilities, and the National Oceanographic Data Center. Presents budget summaries by Federal Agency and by functional area, work of the International Cooperative Investigation of the Tropical Atlantic, and United States participation in the International Indian Ocean Expedition.

National Plan for Ocean Surveys, ICO Pamphlet No. 7, 49 pp., processed. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington 25, D. C., May 1963. The primary objective of the Ocean Survey Plan is to provide for the efficient and systematic collection, compilation, and presentation of oceanographic data for use in furthering our understanding of the sea for science, for the national economy, and for defense. Among other agencies participating in the program, the Bureau of Commercial Fisheries is responsible for the management and wise utilization of the commercially valuable living resources of the sea. The collections of physical and chemical data together with the biological data are designed to provide information needed in understanding the relation of the living population to its physical-chemical environment, an important aspect in the prediction of where commercially profitable stocks may be found.

Oceanographic Ship Operating Schedules, Fiscal Year 1964, ICO Pamphlet No. 12, 31 pp., processed. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington 25, D. C., May 1963. An annual publication containing the planned schedules, type of work, and general areas of operation for all Government-owned or sponsored oceanographic ships of the United States. Included are vessels of the U. S.

Bureau of Commercial Fisheries, National Science Foundation, U. S. Coast and Geodetic Survey, U. S. Coast Guard, U. S. Naval Oceanographic Office, University of Washington, Oregon State University, Scripps Institution of Oceanography, Agricultural and Mechanical College of Texas, University of Miami, Hudson Laboratory, Lamont Geological Observatory, Narragansett Marine Laboratory, and Woods Hole Oceanographic Institution.

"Oceanography: After a Prosperous Decade, Agency Planners Agree on a Grand Design for Next 10 Years," by John Walsh, article, *Science*, vol. 141, no. 3580, August 9, 1963, pp. 506-507, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D. C. One of the fastest growing items in the Federal science budget has been appropriations for oceanography, which rose from less than \$10 million in fiscal year 1953 to about \$124 million for fiscal 1963. The Interagency Committee on Oceanography recently made public its most ambitious effort to date, *Oceanography: The Ten Years Ahead*, subtitled "A Long Range National Oceanographic Plan, 1963-1972." Over 10 years the plan calls for an increase in the number of oceanographic ships from 76 to 128 (some 30-40 ships would be replaced), major laboratories from about 50 to more than 70, and professional manpower from 2,700 to over 6,000. The annual oceanography budget in 1970 would be \$350 million.

"R. V. Crawford's Work," by W. G. Metcalf, article, *Oceanus*, vol. IX, no. 4, June 1963, pp. 8-9, illus., printed. Woods Hole Oceanographic Institution, Woods Hole, Mass. Discusses activities of this research vessel between mid-January and the end of April, 1963. This cruise was one phase of an international effort in equatorial Atlantic Ocean current studies known as EQUALANT I.

"Un Nuevo Buque de Investigaciones Oceanograficas" (A New Vessel for Oceanographic Investigations), by Arwed H. Meyl, article, *Iberica*, vol. 41, no. 11, May 1963, pp. 198-199, illus., printed in Spanish. *Iberica*, Palau, 3, Apartado 759, Barcelona-2, Spain. This vessel is being built for the German Federal Republic, and she is expected to participate in the Indian Ocean oceanographic survey.

#### OCEAN PERCH:

Migrations of the Redfish (SEBASTES MENTELLA Travin) of the Bear Island-Spitsbergen Stock, by V. P. Sorokin, 14 pp., processed. (Translated from the Russian, Sovetskies Rybokhoziaistvennye Issledovaniya v Severo-Zapadnoi Chasti Atlanticheskogo Okeana, 1960, pp. 285-298.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England, 1962.

#### OYSTERS:

"Comments on 'Microecological Factors in Oyster Epizootics' by Marshall Laird," by Carl N. Shuster, Jr. and Robert E. Hillman, article, *Chesapeake Science*, vol. 4, no. 2, June 1963, pp. 101-103, printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

Occurrence and Distribution of the Dredge Oyster (*OSTREA SINUATA*) in Tasman and Golden Bays, by

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B. R. Tunbridge, *Fisheries Technical Report No. 6*, 42 pp., illus., processed. New Zealand Marine Department, Wellington, New Zealand, 1962.

**Survey of the Oyster Potential of Hawaii**, by Albert K. Sparks, 50 pp., illus., processed. Division of Fish and Game, Department of Land and Natural Resources, Honolulu, Hawaii, May 1963. Discusses a survey conducted in March 1962 of existing oyster beds in the Hawaiian Islands. Covers the history of efforts to culture various species of oysters, methods and materials used in the present survey, description of oyster beds encountered, discussion of the biology and ecology of Hawaiian oysters, inspection of potential sites for transplantation of oysters from West Loch, Pearl Harbor, and recommendations for future development of oyster stocks.

#### PHOTOGRAPHY:

**Underwater Photography Simplified**, by Jerry Greenberg, 53 pp., illus., printed. Seahawk Products, P. O. Box 1157, Coral Gables, Fla., 1958.

#### PHYSIOLOGY:

"How Fish Breathe," by Arden R. Gaufin, article, *Pennsylvania Angler*, vol. 32, no. 7, July 1963, pp. 2-3, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa.

**Olfaction in Fish**, U. S. S. R., by B. A. Flerov, OTS 63-21480, 19 pp., printed, 50 cents. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230, April 1963.

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**The Pilchard of South-West Africa (SARDINOPS OCELLATA Pappe)**, Notes on Zooplankton and Phytoplankton Collections Made Off Walvis Bay, by W. E. Kollmer, Investigational Report No. 8, 75 pp., illus., printed. Administration of South-West Africa, Marine Research Laboratory, Windhoek, South-West Africa, 1963. Presents information on relations between zooplankton and the delimitation of the pilchard fishing area off Walvis Bay; relations between phytoplankton quantities and the fishing area off Walvis Bay; and monthly recordings of phytoplankton species in the area off Walvis Bay during 1959 and 1960.

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"Notes on the Winter-Food and Parasites of the Plaice (*Pleuronectes platessa L.*)," by Helen Rost and T. Soot-Ryen, article, *Astarte*, no. 3, June 30, 1952, pp. 1-7, printed. Zoological Department, Tromso Museum, Tromso, Norway.

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**A Quantitative and Qualitative Study of Some Indo-West Pacific Plankton**, by J. H. Wickstead, Colonial Office Fishery Publication No. 16, 200 pp., illus., printed, 55s. (about US\$7.70). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, 1961.

#### PORUGAL:

**Gremio dos Armadores da Pesca do Bacalhau, Relatorio e Contas do Exercicio de 1962 e Orcamento para 1963 (Cod Fishing Vessel Owners' Guild, Statement of Operations for 1962 and Budget for**

1963), 20 pp., printed in Portuguese. Comissao Revisora de Conta, Lisbon, Portugal, January 21, 1963.

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**Tidewater Potomac, Clean Water--Key to the Future**, 7 pp., illus., printed. Interstate Commission on the Potomac River Basin, 815 17th St. NW., Washington, D. C., 1959.

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"Uber die Moglichkeiten zur Steigerung der Arberitsproduktivitat" (On the Possibility of Increasing Labor Productivity), by Eckhard Kienast, No. 221, 5 pp., printed in German. (Reprinted from *Deutsche Fischerei-Zeitung*, vol. 10, no. 2, 1963, pp. 33-37.) Überreicht vom Institut für Fischereiwesen, der Humboldt-Universität zu Berlin, Josef-Nawrocki-Strasse 7, Berlin-Friedrichshagen, Germany.

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"Isolation of Protamine Sulfate from Bonito, *Katsuwonus vagans* Lesson, and Some of Its Properties," by Terutake Honma, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 26, January 1960, pp. 21-24, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

#### SALMON:

**The Exploitation, Scientific Investigation and Management of Salmon (Genus ONCORHYNCHUS) Stocks on the Pacific Coast of the United States in Relation to the Abstention Provisions of the North Pacific Fisheries Convention**, Bulletin No. 10, 168 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 6, B. C., Canada, 1962. The purpose of the papers contained in this bulletin was to provide information which would aid the Commission in determining annually, beginning in 1958, whether the salmon stocks originating in the rivers of the United States, including Alaska, continued to meet the requirements for abstention given in the Convention. The papers were submitted to the Commission between 1956 and 1960 by representatives of the governments of the United States and Japan. The conditions or qualifications for continued abstention, as given in Article IV of the Convention, are: (1) Evidence based upon scientific research indicates that more intensive exploitation of the stock will not provide a substantial increase in yield which can be sustained year after year; (2) the exploitation of the stock is limited or otherwise regulated through legal measures by each Party which is substantially engaged in its exploitation, for the purpose of maintaining or increasing its maximum sustained productivity; such limitations and regulations being in accordance with conservation programs based upon scientific research; and (3) the stock is the subject of extensive scientific study designed to discover whether the stock is being fully utilized and the conditions necessary for maintaining its maximum sustained productivity.

"Isolation and Identification of Adrenosterone in Salmon (*Oncorhynchus nerka*) Plasma," by D. R. Idler, P. J. Schmidt, and I. Bitner, article, *Canadian Journal of Biochemistry and Physiology*, vol. 39, October 1961, pp. 1653-1654, printed. Canadian Journal of Biochemistry and Physiology, Division of Adminis-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

tration, The National Research Council, Sussex St., Ottawa, Canada.

"Notes on the Blood of Masu Salmon (*Oncorhynchus masu*) during Upstream Migration for Spawning, with Special Reference to the Osmoconcentration," by Tatsuro Kubo, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 12, November 1961, pp. 189-195, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

The Passage of Migrating Atlantic Salmon and Vimba Spawners Through the Fishway of the Kegum Hydro-Electric Station, by E. A. Kirov and Z. I. Chudova, Translation Series No. 399, 1 p., processed. (Translated from the Russian, *Trudy N.-I. Instituta Rybnogo Khoziaistva Soveta Narodnogo Khoziaistva Latviiiskoi SSSR* (Trudy LatvNIRO), vol. 3, 1961, p. 493.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, 1962.

Patterns and Principles in the Dynamics of Abundance of Baltic Salmon, by M. N. Lishev and E. Ya. Rimsh, Translation Series No. 395, 6 pp., processed. (Translated from the Russian, *Trudy N.-I. Instituta Rybnogo Khoziaistva Soveta Narodnogo Khoziaistva Latviiiskoi SSSR* (Trudy LatvNIRO), vol. 3, 1961, pp. 95-101.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, 1962.

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1962, 27 pp., illus., processed. Department of Fisheries of Canada, Pacific Area, Economics Branch, 1155 Robson St., Vancouver 5, B. C., Canada, March 29, 1963.

The Value of Antibiotics in Artificial Rearing of Young Salmon, by E. M. Malikova and N. I. Kotova, Translation Series No. 397, 1 p., processed. (Translated from the Russian, *Trudy N.-I. Instituta Rybnogo Khoziaistva Soveta Narodnogo Khoziaistva Latviiiskoi SSSR* (Trudy LatvNIRO), vol. 3, 1961, p. 442.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, 1962.

#### SARDINES:

"Ausencia de Nadadeiras Ventrais em *Lycengraulis barburi* Hildebrand, 1943" (Specimen of *Lycengraulis barburi* Hildebrand, 1943, Lacking Ventral Fins), by Rui Simoes de Menezes, Series 1C, Publication No. 236, 2 pp., illus., printed in Portuguese with English summary. (Reprinted from *Bol. Soc. Cear. Agron.*, vol. 2, June 1961, pp. 57-58.) Servico de Piscicultura, Fortaleza, Ceara, Brazil.

#### SCALLOPS:

"Biochemical Studies on Muscle of Sea Animals. I--On Adenylic Acid in the Boiled Liquor with the Muscle of Scallop, *Pecten yessoensis*," by Atsushi Iida, Isao Araki, and Kiichi Murata, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 12, August 1961, pp. 151-159, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### SEALS:

"Evaluation of a Method of Taking the Census of the White Sea Harp Seal and Considerations of the Status of this Seal," by Yu. I. Nazarenko and A. V.

Yablokov, article, *Translations from Zoologicheskiy Zhurnal*, vol. 41, no. 12, 1962, OTS 63-20176, pp. 34-44, illus., processed, \$1.25. (Translated from the Russian, *Zoologicheskiy Zhurnal*, vol. 41, no. 12, 1962, pp. 1875-1882.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 7, 1963.

"Harp Seals and the Sealing Industry," by David Sergeant, article, *Trade News*, vol. 15, no. 12, June 1963, pp. 3-9, illus., processed. Director of the Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Summarizes present knowledge of the harp seals' biology, the current state of the fishery, and its likely impact on the stocks. The status of the rarer hood seal and the methods of killing seals are also discussed. These stocks migrate from Greenland to the Atlantic Coast of Canada and Arctic Coast of the U. S. S. R. Future stabilization of these declining herds is possible as a result of Canada's 1961 proposal to the International Commission for the Northwest Atlantic Fisheries (ICNAF) that the conservation of harp and hood seals be brought under the authority of this organization.

Some Ecological Factors Determining Seasonal Changes in Distribution of the White Sea Harp Seal Population (*PAGOPHOCA GROENLANDICA*), by K. K. Chapsky, Translation Series No. 380, 23 pp., processed. (Translated from the Russian, *Trudy Soveshchaniia, Ikhilologicheskoi Komissii Akademii Nauk SSSR*, no. 12, 1961, pp. 150-163.) Fisheries Research Board of Canada, Arctic Unit, 505 Pine Ave. W., Montreal 18, Que., Canada, 1962.

On the Stock of Hood Seals in the Northern Atlantic, by Birger Rasmussen, Translation Series No. 387, 31 pp., processed. (Translated from the Norwegian, *Fiskeri og Havet*, no. 1, January 1960.) Fisheries Research Board of Canada, Arctic Unit, 505 Pine Ave. W., Montreal 18, Que., Canada.

#### SEaweeds:

Annual Report for 1962, 21 pp., printed. Institute of Seaweed Research, Inveresk, Midlothian, Scotland. Discusses developments in the Scottish and foreign seaweed byproducts industry during 1962, and the Institute's information and technical assistance services. Also discusses production of alginates from seaweed, use of seaweed meal in animal feedstuffs, and development of fertilizers from seaweed. Includes results of investigations on algal polysaccharides, biochemical studies on seaweeds, nitrogenous constituents of marine algae, and chemical composition of marine micro-algae, and a list of publications on seaweeds issued during 1962.

"Chemical Studies on Volatile Constituents of Seaweeds. XIX--On Volatile Constituents of *Prophyra tenera* (2)," by Teruhisa Katayama, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, July 1961, pp. 710-712, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

The Effect of Varying Concentrations of Norwegian Seaweed (*ASCOPHYLLUM NODOSUM*) on Duncan Grapefruit and Pineapple Orange Seedlings under Greenhouse Conditions, by J. B. Aitken, T. L. Senn,

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and J. A. Martin; "The Effect of Norwegian Seaweed (ASCOPHYLLUM NODOSUM) on the Development of Certain Horticultural and Special Crops," by T. L. Senn and others, Research Series, South Carolina Agricultural Experiment Station, No. 24, 28 pp.; No. 23, 45 pp., printed. South Carolina Agricultural Experiment Station, Clemson College, Clemson, S.C., 1961.

#### SHARKS:

"Electrocardiographic Studies of Free-Swimming Sharks," by Perry W. Gilbert and Steven D. Douglas, article, *Science*, vol. 140, no. 3574, June 28, 1963, p. 1396, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington 5, D.C.

"The Shark that Hibernates," by L. Harrison Matthews, article, *New Scientist*, vol. 13, March 29, 1962, pp. 756-759, illus., printed. *New Scientist*, Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

#### SHELLS:

"If You Don't Know Your Cone Shells, Don't Touch Them!" article, *Pacific Islands Monthly*, vol. 33, no. 12, July 1963, pp. 29, 31, 35, illus., printed. *Pacific Islands Monthly*, G. P. O. Box 3408, Sydney, Australia. The danger of inexperienced people handling any kind of cone shell found on reefs throughout the Pacific has been emphasized recently following publicity in Australia about a highly lethal cone shell, *Conus geographus*.

"Shell Polishing and Carving," by R. Powell, article, *South Pacific Bulletin*, vol. 11, no. 2, 1961, pp. 20-22, printed. South Pacific Commission, G. P. O., Box 5254, Sydney, Australia.

#### SHRIMP:

"Preparation of Chitin and Glucosamine from Prawn Shell Waste," by P. V. Kamalastri and P. V. Prabhu (Central Fisheries Technological Research Station, Ernakulam, India), article, *Chemical Abstracts*, vol. 56, June 11, 1962, 14605a, printed. The American Chemical Society, 1155 16th St. NW., Washington 6, D.C.

#### SMALL BUSINESS MANAGEMENT:

Management Audit for Small Manufacturers, 58 pp., printed, 25 cents. Small Business Administration, Washington, D.C., 1963. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20420.) The questions and answers provided in this booklet should aid the owner-manager of a small manufacturing plant in planning, organizing, directing, coordinating, and controlling the activities of his business adequately. The questions and answers, divided into 15 categories, cover vital areas in the management of a business.

Starting and Managing a Small Business of Your Own, 49 pp., illus., printed, 25 cents. Small Business Administration, Washington, D.C., 1962. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20420.) Describes the common problems of launching small business operations in general, suggesting specific steps to help those interested in starting and man-

ging a small business to arrive at sound decisions concerning these problems.

#### SMOKING:

"Oil Drum Smoke House," by Herman Wiedenheft, article, *Pennsylvania Angler*, vol. 32, no. 8, August 1963, p. 16, illus., printed, single copy 25 cents. Pennsylvania Fish Commission, South Office Bldg., Harrisburg, Pa.

#### SPORT FISHING:

*Salt-Water Fishing Methods*, 122 pp., printed. Collier Books, 111 Fourth Ave., New York 3, N.Y., 1962.

#### STANDARDS:

"De Microbiologische Gesteldheid van Vis en Visproducten in Verband met de Volksgezondheid" (The Microbiological State of Fish and Fish Products in Relation to Human Health), by A. Ruiter, article, *Conserva*, vol. 10, no. 8, 1962, pp. 157-161, printed in Dutch. Moorman's Periodieke Pers N.V., 1 Zwarteweg, The Hague, Netherlands.

#### What Consumers Should Know About Food Standards,

Food and Drug Administration Publication No. 8, 14 pp., illus., printed, 15 cents. Food and Drug Administration, U.S. Department of Health, Education, and Welfare, Washington, D.C., 1963. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20420.) Discusses the establishment of standards under the Food, Drug, and Cosmetic Act; enforcement of the law by the Food and Drug Administration; action taken against violators; standards of identity, quality, fill of container, and enriched products; and honesty in labeling.

#### STERN TRAWLERS:

"Le 'Pont-Abri' Gagnera-t-il la Bataille du Chalutage Arriere? France Peche a Embarque pour Vous 15 Jours sur le Paris" (Will the Covered Bridge Win the Stern Trawler Dispute? France Peche Spent for You 15 Days on Board the "Paris"), article, *France Peche*, no. 75, July-August 1963, pp. 20-29, 31-38, illus., printed in French. France Peche, Boite Postale 179, Lorient, France.

#### STICKWATER:

"Fish Byproducts: Preservation of White Fish Stickwater," article, *Torry Research Station, Annual Report 1960*, p. 27, printed. *Torry Research Station*, Aberdeen, Scotland, 1961.

#### STRIPED BASS:

"Study of Striped Bass Continuing Process," by Jefferson C. Fuller, Jr., article, *South Carolina Wildlife*, vol. 10, no. 2, Spring 1963, pp. 12-13, illus., printed. South Carolina Wildlife Resources Department, Box 360, Columbia, S.C. As a result of the survival and reproduction of striped bass landlocked in the Santee-Cooper Reservoir, S.C., stocking of other inland waters was begun and a hatchery opened. Spawning habits are being studied and efforts made to accommodate the operation of a barge waterway to allow normal migration of this species. Good prospects are in sight for additional striped bass fisheries to meet the growing demand.

#### TARIFFS:

*Tariff Classification Study, Fourth Supplemental Report* (Report to the President and to the Congress

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Pursuant to Section 101 of the Tariff Classification Act of 1962), 17 pp., processed. United States Tariff Commission, Washington, D.C. 20436, May 9, 1963.

#### TERRITORIAL WATERS:

"La Reglementation Internationale de la Peche--Du Sandetie au Bresil ou le Probleme des Eaux Reserves" (International Regulation of Fishing--The "Sandetie" off Brazil or the Problem of Reserved Waters), by M. Parquier, article, France Peche, no. 73, May 1963, pp. 33-36, illus., printed in French. France Peche, Boite Postale 179, Lorient, France.

#### TEXAS:

Annual Report of the Game and Fish Commission, State of Texas, for the Fiscal Year 1961-1962, 130 pp., illus., printed. Covers activities of the Commission during September 1, 1961, through August 31, 1962. Includes, among others, sections on water pollution control, inland fisheries, and coastal fisheries. Discusses fresh-water research and management, State fisheries investigations, contract commercial fishing for rough fish and turtles, and hatcheries. The coastal fisheries activities reported include shrimp, blue crab, and oyster projects; finfish research; and bay area studies. Includes statistical data on quantity of landings in coastal areas and the Gulf.

#### TRAWLERS:

"The Long-Range Medium Refrigerated Fishing Trawler Mayak," by G. P. Dubskiy, article, Translations on Soviet Transportation, No. 37, pp. 28-41, illus., processed, \$2.75. (Translated from the Russian, Sudostroyenie, no. 9, September 1962, pp. 1-7.) Office of Technical Services, U.S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D.C., February 11, 1963.

"A la Recherche d'un Reglement International la Stabilite des Chalutiers" (Research on an International Regulation on the Stability of Trawlers), by D. Paultet, article, France Peche, no. 71, March 1963, pp. 23-26, illus., printed in French. France Peche, Boite Postale 179, Lorient, France.

#### TRAWLING:

"Tiorieticheskie Osnovy dia Rascheta Dvizhienia Sudna s Tralom" (Theoretical Basis for Calculation of the Motion of a Vessel Towing a Trawl), by I. R. Matrosov, article, Rybnoe Khoziaistvo, vol. 37, no. 6, 1961, pp. 41-53, illus., printed in Russian. VNIRO Glavniproekt, pri Gosplanie SSSR, Moscow, U.S.S.R.

#### TRAWLS:

An Improved Mediterranean Trawl, by E. H. Dahlgren and L. F. Farina, 13 pp., illus., printed. Service de la Marine Marchande et des Peches Maritimes, Tunis, Tunisia, February 1962. The original design of this modified trawl was developed in Italy, beginning in 1935. The design was granted Italian patent rights in 1938. The outbreak of war in 1939 disrupted fishing in the region until some years after the cessation of hostilities, and efforts to renew the development were discontinued until 1960, when it was demonstrated in Yugoslavia under the auspices of the Food and Agriculture Organization.

The trials described in this report were carried out by the U.S. Special Mission for Economic and Technical Assistance under the sponsorship of the Chief of the Merchant Marine and Fisheries Service of Tunisia, in 1961. Describes the design of the net, number and size of meshes, hanging of the trawl, and a sorting trough.

#### TUNA:

"Abrasion Test of Tuna Longline," by Katsuji Honda, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, January 1962, pp. 1-4, printed. Japanese Society of Scientific Fisheries, Shiba-Kai-gandori 6, Minato-Ku, Tokyo, Japan.

The Australian Tunas, by D. L. Serventy, Report No. 4, 51 pp., illus., printed. Division of Fisheries, Council for Scientific and Industrial Research, 314 Albert St., East Melbourne, Australia, 1941.

"La Campagne Thoniere Africaine: Les Basques Etaient a l'Heure, Bretons et Vendees Sont Venus Trop Tard!" (The African Tuna Season: The Basques Were on Time, Bretons and Vendees Had Come Too Late!), by Rene Benoit, article, France Peche, no. 75, July-August 1963, pp. 41-42, illus., printed in French. France Peche, Boite Postale 179, Lorient, France.

"A Preliminary Report on Tuna in West Coast Waters of South Africa. Part III," by B. van D. de Jager, C. S. de V. Nepgen, and R. J. van Wyk, article, The South African Shipping News and Fishing Industry Review, vol. XVIII, no. 6, June 1963, pp. 73, 75, 77, 79, 81, 83, 85, 87, illus., printed, single copy 25 c. (about 35 U.S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, South Africa Republic. The last of a three-part series, this article covers tuna competitors and predators; possible relationship between the presence of tuna and the temperature of the water; possible relationship between catch and hydrological environmental conditions; and hydrological data collected in the area, Winter 1960 to Autumn 1961. Concludes that 4 species of tuna occur off the Cape west coast in considerable numbers and can be taken by Japanese-type long-line. However, too little is known of the long-term pattern of occurrence to be certain that they will always be present in sufficient numbers to justify commercial exploitation.

"Relation between Soaking Time and Catch of Tunas, in Longline Fisheries," by K. Sivasubramanian, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, September 1961, pp. 835-845, printed. Japanese Society of Scientific Fisheries, Shiba-Kai-gandori 6, Minato-Ku, Tokyo, Japan.

Le Thon Rouge et le Germon, THUNNUS THUNNUS (L.) et GERMO ALALUNGA (Bonn.), Morphologie, Biologie et Peche (Bluefin Tuna and Albacore, Thunnus thynnus (L.) and Germon alalunga (Bonn.)), Morphology, Biology and Fishery, by F. Frade and H. Vilela, Estudos, Ensaios e Documentos No. 98, 90 pp., illus., printed in French with Portuguese and English summaries. Junta de Investigacoes do Ultramar, Praca do Principe Real, 20, Lisbon, Portugal, 1962.

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## TURKEY:

Balik ve Balıkçılık (Fish and Fishery), vol. 11, no. 7, July 1963, 35 pp., illus., printed in Turkish with English table of contents. Balıkçılık Mülkürü, Besiktas, İstanbul, Turkey. Includes, among others, these articles: "Recommendations on Turkish Fisheries;" "Fishing Bonitos with Hook and Line in Territorial Waters;" and "Characteristics of Various Kinds of Fish Oil."

## UNITED KINGDOM:

Torry Research Station Annual Report, 1962, on the Handling and Preservation of Fish and Fish Products, 50 pp., illus., printed, 80 cents. Sales Section, British Information Services, 845 Third Ave., New York 22, N. Y., 1963. Describes accomplishments in research during 1962 on improvement in handling, treatment, and quality of wet fish; freezing and cold storage; smoke curing; canning; and fishery byproducts. Also includes work in bacterial flora of ocean perch, biochemistry of starvation, autoxidation of phospholipids, low molecular weight organic components of flesh, hydration and dehydration of proteins, effects of fat content on diffusion of water in fish muscle, and related subjects. Also contains a list of reports and papers published during 1962 on the handling and preservation of fish and fish products.

## UNITED STATES GOVERNMENT:

Federal Organization for Scientific Activities, 1962, NSF 62-37, 606 pp., illus., printed, \$3.50. National Science Foundation, Washington, D. C., August 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20420.) The information contained in this directory was derived primarily from a survey of 40 departments and agencies made by the National Science Foundation in 1961. The data for the most part are correct as of December 1961. The Federal organization for science consists of components of both the Executive and Legislative Branches of the Government. In the Executive Branch, 10 departments and 27 independent agencies contain units which plan, administer, conduct or support scientific activities. Within the Legislative Branch, Congressional Committees, the Library of Congress, the Botanic Garden and the Government Printing Office engage in scientific activities. These agencies range widely in size, functions, fields of science, types of scientific and technological activities supported, contact with non-Government institutions, and types of facilities required. A section on the U. S. Fish and Wildlife Service covers its objectives, scientific activities, the American Fisheries Advisory Committee, field stations and installations, and major developments since 1954.

United States Government Organization Manual, 1963-64, 788 pp., illus., printed, \$1.75. Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D. C., June 1, 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20420.) The official organization handbook of the Federal Government. Contains the Constitution of the United States and sections describing the agencies in the legislative, judicial, and executive branches of the Government. Supplemental information includes brief discussions of

quasi-official agencies, selected multilateral international organizations, selected bilateral organizations, charts of the principal Federal agencies, and appendices relating to abolished and transferred agencies and to Government publications. Also describes the agencies connected with fisheries: U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife.

## U. S. S. R.:

"Development of the Fishing Industry, Fishing and Problems of Biological Science in the Light of the Resolutions of the Twenty-Second Congress of the CPSU," by G. B. Mel'nikov and N. Ye. Sal'nikov, article, Translations from Zoologicheskiy Zhurnal, vol. 41, no. 12, 1962, OTS 63-20176, pp. 1-16, processed, \$1.25. (Translated from the Russian, Zoologicheskiy Zhurnal, vol. 41, no. 12, 1962, pp. 1771-1782.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 7, 1963.

Recent Developments in Soviet Lake and River Fishing, OTS 63-21863, 22 pp., printed. Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., May 20, 1963.

## VESSELS:

"Fiberglass Pilchard Vessel Is Being Built in Cape," article, The South African Shipping News and Fishing Industry Review, vol. XVIII, no. 6, June 1963, pp. 63, 65, illus., printed, single copy 25c. (about 35 U. S. cents.) Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, South Africa Republic. The largest fiberglass fishing vessel to be built for commercial use in South Africa, and possibly the largest in the world, is nearing completion near Cape Town. She is 67 feet, 6 inches long, and has a beam of 21 feet. When completed the hull will consist of 8 outside layers of fiberglass and 6 inside layers, with a layer of plastic foam in between the two. Over-all thickness will be  $1\frac{1}{2}$  inches. Testing results showed that the fiberglass hull was in many cases stronger than a wooden hull and far more weather-resistant than steel. Because of the leak-proof qualities of fiberglass, the new vessel will be allowed to carry more cargo than a wooden vessel of the same size. Another advantage of this material is that it does not harbor bacteria, thus making the vessel easier to clean.

"New State Standards for Ships of the Fishing-Industry Fleet," by G. B. Terent'yev, article, Translations on Soviet Transportation, No. 37, pp. 54-72, illus., processed, \$2.75. (Translated from the Russian, Rybnoe Khoziaistvo, no. 10, October 1962, pp. 45-55.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 11, 1963.

"La Nouvelle Orientation de la Peche au Thon: Un Problème de Construction Navale" (The New Orientation in the Tuna Fishery: A Problem of Ship Construction), by R. Lenier, article, France Peche, no. 75, July-August 1963, pp. 15-17, illus., printed in French. France Peche, Boite Postale 179, Lorient, France.

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#### WALRUS:

Marine Mammals, Work Plan J. by Samuel J. Harbo, Jr., 1960-61 Pittman-Robertson Project Report, vol. II, no. 9, 58 pp., illus., processed. Alaska Department of Fish and Game, Juneau, Alaska.

"The Walrus (*Odobenoides rosmarus*--L.) Off the Coast of Norway in the Past and After the Year 1900, Together with some Observations on Its Migrations and 'Cruising Speed,'" by Hjalmar Munthe-Kaas Lund, article, Astarte, no. 8, July 25, 1954, pp. 1-12, illus., printed. Zoological Department, Tromso Museum, Tromso, Norway.

#### WEATHER CHARTS:

The following processed weather charts, 2 pp. each, are published by the Weather Bureau, U. S. Department of Commerce, Washington, D. C., and are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20420, 10 cents each. Charts show stations displaying small craft, gale, whole gale, and hurricane warnings, explanations of warning displays, and schedules of AM and FM radio, TV, and radiophone stations that broadcast weather forecasts and warnings.

Coastal Warning Facilities Chart, Eastport, Me., to Montauk Point, N. Y., 1963.

Small Craft, Gale, and Whole Gale Warning Facilities Chart, Great Lakes: Huron, Erie, and Ontario, 1963.

Small Craft, Gale, and Whole Gale Warning Facilities Chart, Great Lakes: Superior and Michigan, 1963.

#### WHALES:

"Marking of Humpback Whales in the Southern Hemisphere," by M. V. Ivashin, article, Translations from Zoologicheskiy Zhurnal, vol. 41, no. 12, 1962, OTS 63-20176, pp. 17-33, illus., processed, \$1.25. (Translated from the Russian, Zoologicheskiy Zhurnal, vol. 41, no. 12, 1962, pp. 1848-1858.) Office of Technical Services, U. S. Department of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 7, 1963.

On Methods of Aging Toothed Whales, by S. E. Kleinberg and G. A. Klevezal<sup>1</sup>, Translation Series No. 407, 9 pp., processed. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 145, no. 2, 1962, pp. 460-462.) Fisheries Research Board of Canada, Arctic Unit, 505 Pine Ave. W., Montreal 18, Que., Canada, November 1962.

"The Occurrence of the Southern Bottle-Nosed Whale, *Hyperoodon planifrons* Flower, in New Zealand Waters," by Charles McCann, article, Records of the Dominion Museum, vol. 4, no. 3, November 30, 1961, pp. 21-27, illus., printed. Dominion Museum, Wellington, New Zealand.

#### WHALING:

"Departure of Sovetskaya Rossiya Whaling Flotilla for Antarctic," article, Translations on Soviet Transportation, No. 37, p. 120, processed, \$2.75. (Translated from the Russian, Gudok, November 2, 1962, p. 1.) Office of Technical Services, U. S. Depart-

ment of Commerce, Bldg. T-30, Ohio Dr. and Independence Ave. SW., Washington 25, D. C., February 11, 1963.

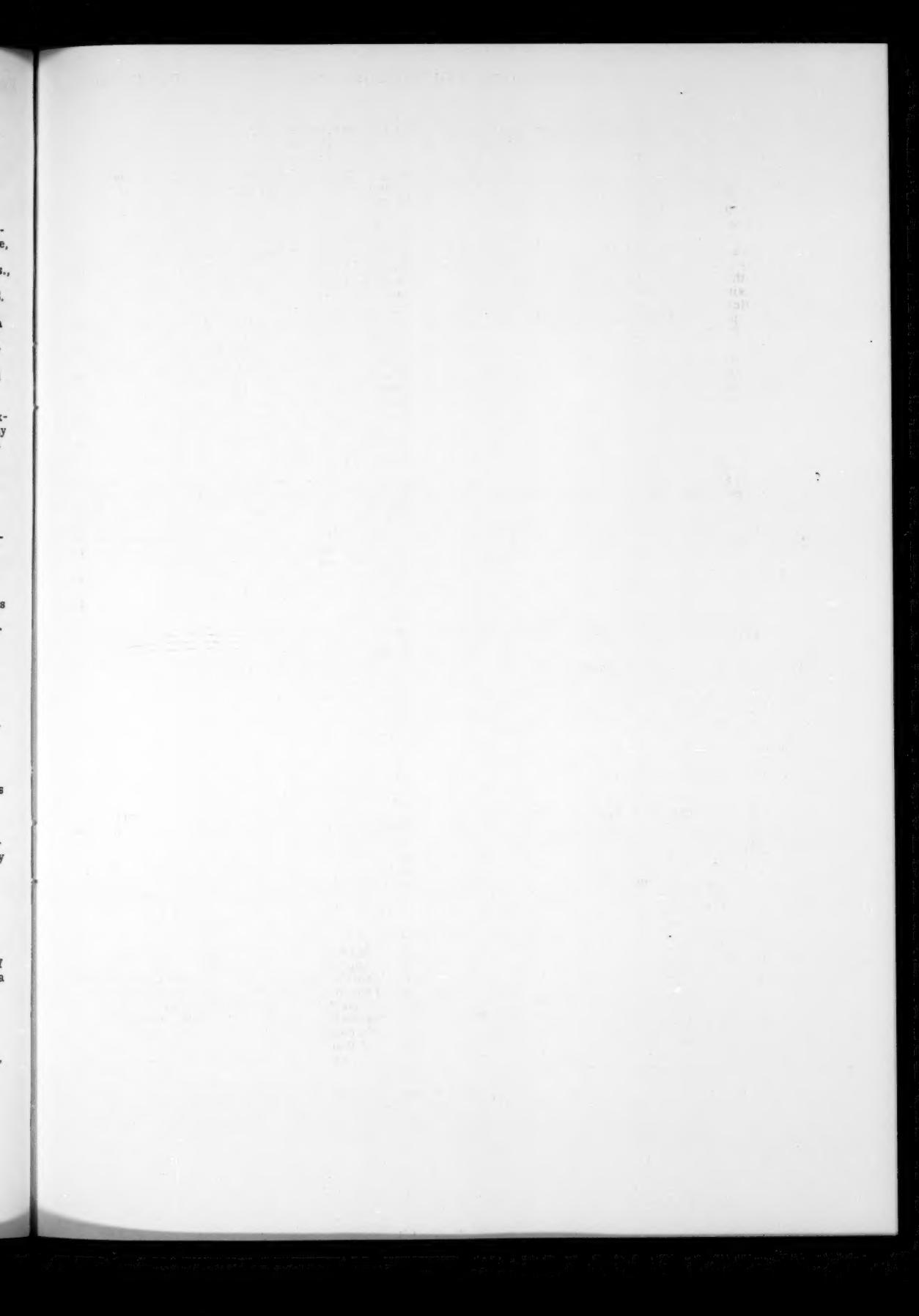
"The Whale Marking Cruise of the Sioux City off California and Baja California," by Dale W. Rice, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 52, no. 6, June 1963, pp. 153-160, illus., printed. Hvalfangerforeningen, Sandefjord, Norway. The whale catcher, Sioux City, chartered by the U. S. Bureau of Commercial Fisheries, made a whale-marking cruise in the waters off southern California and northern Baja California, from San Francisco Bay south to Isla Gaualupe, November 12-December 1, 1962. Purpose of the cruise was: (1) to obtain data on the distribution and abundance of whales and other marine mammals; (2) to locate areas where whales occur in sufficiently large numbers during the winter season to warrant a more extensive marking program in future years; and (3) to mark as many whales as possible. Of 27 whale marks fired, 16 (on 15 fin and one sperm whale) were effective.

Whaler's Eye, by Christopher Ash, 255 pp., illus., printed, \$7.50. The MacMillan Co., 60 Fifth Ave., New York 11, N. Y., 1962. "There She Blows" has been the cry of the lookout man in the crows nest of a whaling vessel for centuries. This book is the picture of whaling as seen by one whaler. Its arrangement of half photographs and half words makes it come alive. It depicts life aboard a whaler and has some excellent pictures of whaling in the Antarctic seas. The classic Moby Dick depicted the early days of whaling, but here we have the author's account of modern whaling based on his trips aboard the whaler Balaena. One important chapter is that devoted to the ethics of whaling and his claim that the whaler is justified in carrying on his trade. After a short description of the living whale, the author describes the whaling fleet, with its factoryships and tankers, freezer vessels, ferries, catchers, and buoy boats. One chapter deals with the different types of whales. Other chapters describe the processing, the whale as raw material, the whaling season, the Antarctic ice, and spare time aboard the vessels. A short chapter summarizes whaling research. And for the photography fan there is a chapter on the techniques and equipment used by the author in taking the 200 photographs that illustrate the book. Anyone with the slightest interest in the sea and in the largest mammals on earth will be interested in possessing a copy of this vividly portrayed story of Antarctic whales and whaling.

--Joseph Pileggi

#### WHITE SEA:

Atlas Nauchnykh Osnov Rybopromyslovoi Karty Onezhskogo Zaliva Belogo Moreia. Chast' 1 (Atlas of the Scientific Bases for the Fisheries Chart of Omega Bay of the White Sea. Part 1--Freshwater Inflow; Surface Seasonal Temperature Changes; Surface Seasonal Salinity Changes; Seasonal Changes in Transparency; Permanent Currents; Zonal Distribution of Water Masses), 54 pp., illus., printed in Russian. Akademii Nauk SSSR, Moscow, U. S. S. R., 1959.



## GIVE A NEW TWIST TO THE HOLIDAY BIRD WITH SEAFOOD STUFFING

One of the rich American traditions which has become a part of family living is the gathering of the clan at Thanksgiving or Christmas for a warm reunion and the traditional holiday meal with all the trimmings. The subtle combination of crisp air, a warming fire, happy sounds of reunion, and complete kitchen confusion create a certain excitement which cannot be duplicated.



Seafood stuffing.

### OYSTER STUFFING

1 can (12 ounces) shucked oysters, fresh or frozen	1 egg, beaten
1 cup chopped celery	1 tablespoon chopped parsley
1 cup chopped onion	1 teaspoon salt
1/4 cup melted fat or oil	1/4 teaspoon poultry seasoning
6 cups soft bread cubes	Dash pepper

Thaw frozen oysters. Drain oysters and chop coarsely. Cook celery and onion in fat until tender; stirring occasionally. Combine all ingredients and mix thoroughly. Makes about 4 cups of stuffing, enough for a 4-pound ready-to-cook bird.

### SHRIMP STUFFING

1 pound shrimp, fresh or frozen	6 cups soft bread cubes
1 cup chopped onion	2 tablespoons chopped parsley
1/4 cup melted fat or oil	1 teaspoon salt
1 egg, beaten	1/2 teaspoon thyme
2 tablespoons milk	Dash pepper

Thaw frozen shrimp. Peel shrimp and remove sand veins. Wash shrimp and cut into small pieces. Cook onion and shrimp in fat until onion is tender; stirring occasionally. Combine egg and milk. Combine all ingredients and mix thoroughly. Makes about 4 cups of stuffing, enough for a 4-pound ready-to-cook bird.

### SCALLOP STUFFING

1/2 pound scallops, fresh or frozen	1 egg, beaten
1/2 cup chopped celery	1 teaspoon salt
1/2 cup chopped onion	1 teaspoon Worcestershire sauce
1/4 cup melted fat or oil	1/2 teaspoon poultry seasoning
6 cups soft bread cubes	Dash pepper

Thaw frozen scallops. Rinse with cold water to remove any shell particles. Chop scallops. Cook celery, onion, and scallops in fat until vegetables are tender; stirring occasionally. Combine all ingredients and mix thoroughly. Makes about 4 cups of stuffing, enough for a 4-pound ready-to-cook bird.

### STUFFING FOR TURKEY

For 5 - 9-pound turkey . . . . .	2 times stuffing recipe
For 10 - 15-pound turkey . . . . .	3 times stuffing recipe
For 16 - 20-pound turkey . . . . .	4 times stuffing recipe
For 21 - 25-pound turkey . . . . .	5 times stuffing recipe



